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The magazine for Model 100* users

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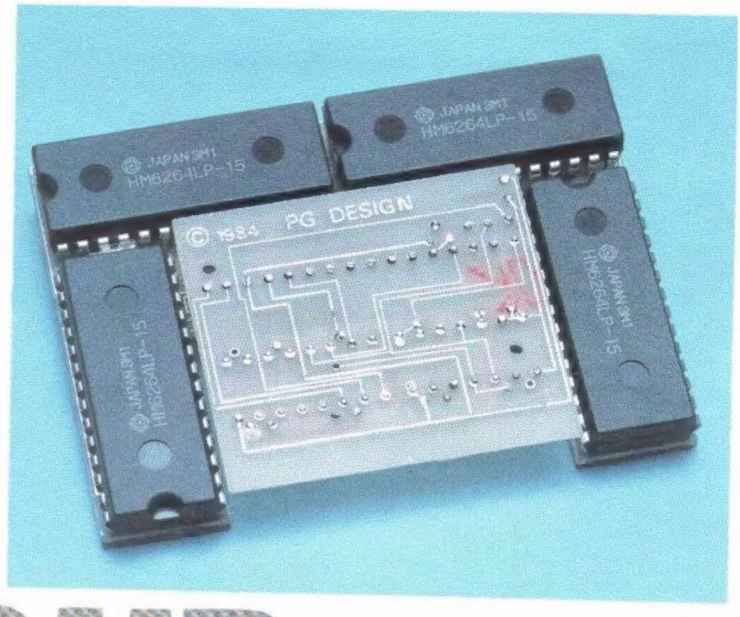

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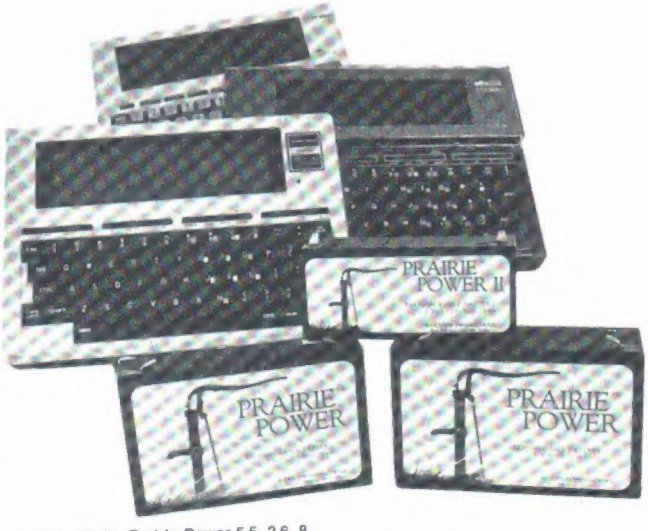

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AUGUST 1984
VOLUME 2 NO. 8

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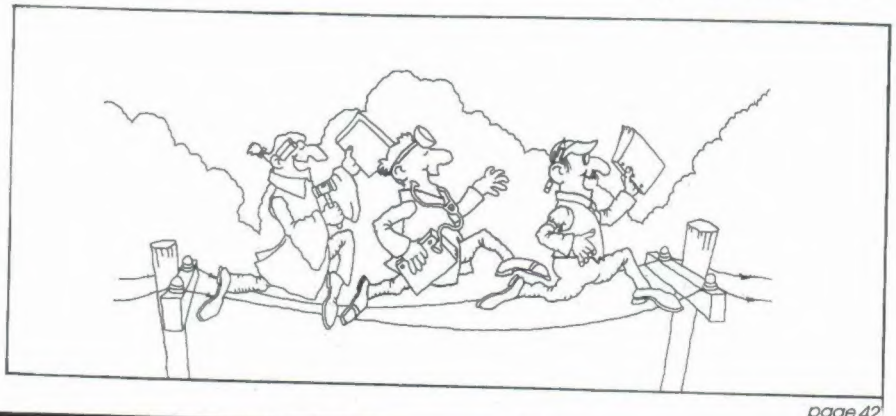

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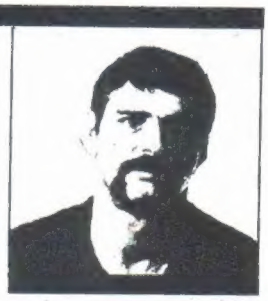


JOHN P. MELLO JR.

THE PERILS OF PORTABILITY ROOST ON AN OWNER WHEN HE LEAVES HIS 100 ALONE

Portability can be a boon and bane for a person acclimated to juicing up life's dead spots by reaching for that friendly beige and black presence many of us keep by our side. What makes the 100 attractive to us, also tantalizes what Dirty Harry calls the "maggots" among us.

Mike Greenly, who has graced these pages in the past with his reports on major computer trade shows, became prey for one of these maggots. Mike left his 100 in his car for 10 minutes one morning in June and when he returned, it was gone. While we know these little boxes of ours are *just* machines, most of us can understand Mike when he laments over his loss:

"My wonderful pal who's shared so much with me. Gone. What words will cross his fuzzy little screen? Into what hands, for what low price, will he be bootlegged?

"It was just a machine. But it was *my* machine, my gateway, my battery-gobbling companion; charmer of many stewardesses; shown off to Ben Rosen, Steve Wozniak, Roger Badertscher, to many worthies who knew so much more than I about its innards, but who saw we were a team.

"My little pal's been clipped. And so has a piece of my heart."

WRITING ON THE NATION. Two major applications for the 100 are writing and telecommunications. Both are addressed in our feature spread this month: writing on the network nation.

For some time now, The Source has offered its members an opportunity to be publishers of electronic publications created by them. What's developed is an electronic form of vanity publishing. Richard Butt, a freelance writer living in Canada, describes what user publishing is all about and how to start your own electronic publication starting on page 38.

If you've ever attended a seminar, you know how difficult it is to keep a session focused, and how frustrating it is to leave an interesting digression undeveloped for the sake of keeping things focused. This problem is doubly true for writer's workshops. By using a sophisticated service called Participate, however, some of these problems can be forgotten. See what we mean in Sharon Lerch's article on page 38.

BIG BLUE MARRIAGE. On occasion, a reader mentions running into IBM PC owners who like what they see in the 100, but shy away from buying one because it's "not IBM compatible." If a PC owner wants to load Lotus 1-2-3 worksheets into a 100, then we'd agree. The two machines aren't compatible. However, there are applications where the 100 and PC can get along famously.

Richard Ross was looking for an IBM compatible way to keep in touch with his office because he travels a lot. He wanted to "dash off memos, letters, and reports from remote locations." His initial attempts to team up his 100 and PC proved frustrating, but he finally surmounted all his problems and has the two machines chatting merrily to each other. See how he did it starting on page 42.

FUNKEY AND SPECTACULATOR. Last month, Jesse Bob Overholt introduced his dandy utility RFU, a program that bundles some often-used functions in one package. In this installment (page 28), Jesse explains how to improve the file-size routine in last month's program, builds a basic text-formatter routine, and adds a memo function.

Spreadsheets have been available for the 100 almost since its release. Now Radio Shack has decided to enter the fray with a machine-language program called Spectaculator. When you begin loading machine-language files into your 100, though, you have to be careful. Bill Walters (page 24), who has left Tandy to return to his former occupation as an airline pilot, explains how to handle more than one machine-language program like Spectaculator in your 100.

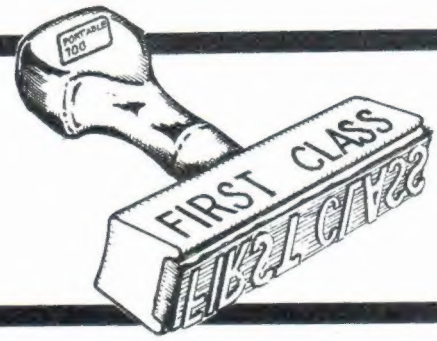
Bill's job-move sidetracked his DVI data-base series this month, but he should be back to the adventures of Joe Example next month.

TABS AND 2000. When you're writing a program, it's nice, but tedious, to have your prompts centered on the screen. David Busch, in this month's installment of automatic 100 (page 14), provides a utility to automatically center your screen messages.

Our telecommunications columnist, Bill Louden, has become the proud owner of a Tandy 2000 "ultra-high performance" computer. After buying such a sleek machine, he couldn't resist the temptation to write about it, so he's departing from his normal discourse this month to explain how he linked his 2000 to his 100 (page 21).

PRO AID. Model 100 owners needing a powerful machine-language utility program for their computer will delight in Pro Aid from Micro Demon (page 56). Carl Oppedahl, who has written an advanced programming book for the 100, goes beyond reviewing Pro Aid by explaining how it uses RAM vectors to accomplish its keyboard routines and how the 100 handles machine-language files. ◀

MAIL.100



Editor's Note: In addition to letters from our readers, we also include in Mail.100 letters from CompuServe and The Source. Those message writers are identified by their CompuServe (CIS ID) or Source (STC ID) identification numbers.

SECOND GENERATION NO THREAT

The news of coming second generation lap-sized computers frequently prompts questions about Radio Shack's plans. We don't publish sales quantities, but Tandy President John Roach has said the Model 100 has been most successful with journalists and in the corporate marketplace.

It's no secret that more portables will be coming from Radio Shack. We still aren't ready to go into detail. Our business users' group was told not to expect a new model until calendar 1985. That still looks accurate to me.

A few personal thoughts on this market. Part of the 100's appeal is its size, shape, and weight. It is clean, simple, and no bother to carry. Another major acceptance factor has been Radio Shack's readily available service and support. There'll be a market for larger, heavier second-generation models with flip-up screens, more memory, and disks, but most likely on a "carry it when you need it basis." This market may be small compared to the 100's market. More may not always be better if it sacrifices convenience!

And then there's price. The 100's price is justifiable for the convenience it offers, even to non-travelers. A 2000- to 4000-dollar pricetag will make need imperative for most users, and it'll compete directly with powerful desktop computers.

It would seem to me that for memos, reports, email, communications, and many true computing functions, smaller and lower-priced computers like the 100 will continue to enjoy a major position in the universe of lap computers.

Ed Juge
Radio Shack
Fort Worth, TX

NOT UP TO SPEED

I'm using an old serial line printer attached to my 100's RS232C serial port. The printer runs fine at 1200 baud. But I wanted to run it at its maximum speed of 9600 baud. This requires handshaking between the printer and the 100 to prevent printer buffer overruns.

The printer doesn't have XON/XOFF protocol capabilities but instead raises a busy signal when its buffer is full (the case with many older printers). The solution to this is to tie the busy signal to the clear to send (CTS pin 5) input of the RS232 port. When busy/CTS goes low the output stops until busy/CTS goes high.

However, the software in the 100 ignores both the CTS (clear to send) and the DSR (data set ready) inputs even though the hardware is in the 100 to perform the function. Why Radio Shack and Microsoft neglected to monitor these signals when everything that's needed is there is beyond me. It also violates true RS232 protocol.

It's possible to monitor these signals using a Basic program which reads port C of the 81C55 IC in the 100 using the INP Basic statement. Port C=BB (HEX)=187(DEC.), and the bits in port C that we want to look at are PC5(DSR) and PC4(CTS). These are the "not" terms and the bit will be turned off if the signal is true. Port C also contains the printer, BCR, RS232, and timer status bits. BIT0=timer, 1=printer busy, 2=printer busy, 3=BCR(input), 4=CTS, 5=DSR.

Run the test program (program listing 1) and use a small piece of wire to jump pin 4(RTS) to pin 5(CTS) and pin 4(RTS) to pin 6(DSR) on the RS232 connector. You'll see the bits change to correspond to the appropriate signals. With this information you should be able to write a program that'll allow handshaking between the 100 and older types of RS232 devices.

I gleaned this information from the Model 100 service manual Radio Shack P/N 26-3801/3802. I recommend this manual, even if you aren't hardware oriented. However, beware that some of the information is incorrect and/or misleading.

Charles M. King III
El Cerrito, CA

```
10 OPEN"COM:5711D"FOR OUTPUT AS1
20 A%=INP(187) ANDB 48
30 PRINT A%: PRINT#1,A%
40 GOTO 10

A%=00 CTS AND DSR=ON
A%=16 CTS=OFF, DSR=ON
A%=32 CTS=ON, DSR=OFF
A%=48 CTS AND DSR=OFF
```

Program Listing 1. Serial Test.

TWO THANKFUL READERS

My thanks to Henry Kisor (see *Portable 100*, April 1984, page 46). The suggestions in his article helped me improve my NEC PC-8201 to Osborne connection. Like Mr. Kisor, I bought the NEC for portable word processing, uploading to the Osborne for a permanent disk copy, and the editing and printing of long documents.

Unlike the 100, the NEC supplies line feeds with the exception of the hard carriage return. Reformatting of the uploaded NEC text was much easier, needing only to seek out the end of paragraphs for the time consuming deleting of the "-", overprint flag, and adding of a hard carriage return.

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DASM - A full featured disassembler. You can easily follow the logic of a program that contains many jumps and calls. During the disassembly process, you can inquire about such things as contents of memory, and the keyword for a given token. The latest version has a split-screen feature that allows you to review the previous 8 lines of disassembly.

Music - Using a modified SOUND routine, it becomes possible to hold a tone as long as a key is held down. This makes it possible to turn the model 100 into a musical instrument.

Here's four more!

1 **ASM - A Powerful 8085 assembler.** ASM contains all the features you expect in an assembler as well as several features that are specific to the model 100. For instance, there is a built-in macro library that will simplify writing code. Among these macros are relative branch instructions for programs intended to be called from BASIC. ASM comes with extensive documentation, including lots of information on the ROM.
Example programs will help the novice get started with machine language programming. The perfect way to learn about machine language.

2 **TEL PRO - A TELCOM enhancement.** With TEL PRO you can remain connected to the phone line and still read the menu, kill files, read text files, upload BASIC programs (with .BA extension), download the screen, access the time, set an alarm, delete unwanted carriage returns from downloaded BASIC programs, and more. An excellent companion program for PRO AID.

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4 **Napoleon - It's you against the computer.** In this card game from England, each player gets a bid and the high bidder tries to make his contract. The computer makes a worthy opponent. You can choose the computer's style of play.

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Simple modification of Mr. Kisor's program (see program listing 2) now reduced that process to one of seeking the end of paragraphs to add a second hard carriage return.

One article like that makes a subscription well worth the money and usually I get at least one good tip a month from *Portable 100*.

Greg Bouffard
Redondo Beach, CA

I want to personally thank John Andreasen for trying to help me get my Realistic Microcassette tape recorder to work with my 100. (See *Portable 100*, January 1984, page 20.) For the past year I've tried to get the two working and ended up throwing the microcassette against a concrete wall.

But I purchased a Sanyo Microcassette TRC5850 and am happy to report it works fine with my 100 with no adaptations. Once in a while it'll create I/O errors when loading a basic program and you have to play a little with the volume setting. If you want a guaranteed error-free load you always can load your programs straight into a regular tape recorder and then transfer them to the microcassette.

But this to me is an inconvenience, carrying around a device that measures 5-by-2¼-by-¾-inches instead of the size of a regular tape recorder. In addition, the tapes are small and it's easy and quick to find programs using fast forward and reverse. Even with the portable disks and wafers coming out, I'll continue to use my Sanyo microcassette for saving and loading on the run.

Lee Steffens
Little Chute, WI

```
10 CLS:PRINT: "NEC TO OSBORNE"
20 MAX FILES = 2
30 EF$ = CHR$(26)
40 PRINT:FILES
50 PRINT:INPUT ".DO FILE TO SEND";FI$
60 IF FI$="" THEN 50
70 OPEN FI$ FOR INPUT AS 1
80 OPEN "COM:5N82XS" FOR OUTPUT AS #2
90 A$=INPUT$(1,1)
100 PRINT #2,A$;
110 IF EOF (1) THEN 130
120 GOTO 90
130 PRINT #2,EF$
140 BEEP:MENU:END
```

Listing 2. NEC to Osborne.

READER OFFERS PRODUCT HELP

As a regular reader, I appreciate every issue, especially your reviews. One of your advertisers, PG Design Electronics, advertises a 32K CMOS expansion. I haven't been able to ascertain from them if the expansion fits inside the existing case, if additional power is required, and if so, is it external and at what voltage. In other words, if I spend $325 will it work and what will it look like when it's set up?

I now have my 100 in a case made by Kangaroo (a very nice product) and a battery pack of 4-C cells in the pouch inside the case. This makes a nice compact unit, an arrangement I'd rather not upset.

Fred W. Forrester
Santa Barbara, CA

For those of you who are unsure, I thought I'd tell you about my experience with PG Design Electronics. I took part in a group buy.

When the unit arrived, it didn't have the BATT.DO file and wouldn't hold a file for longer than a minute or two. I called PG on a Sunday night and received a great deal of assistance.

First, the batteries in the unit weren't fresh, but even after changing to new ones, the chip wouldn't hold a file. They sent me a new chip the next day, which works wonderfully. I can honestly say I've no reservations about dealing with them.

The chip probably has a poor battery

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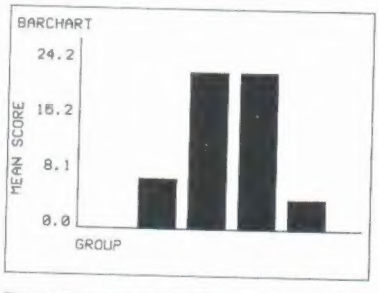

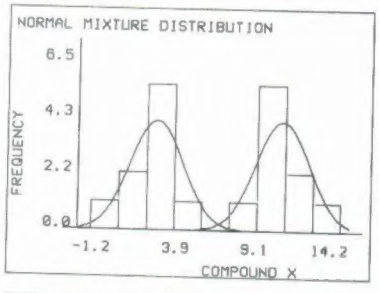

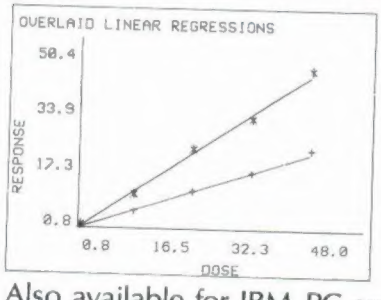

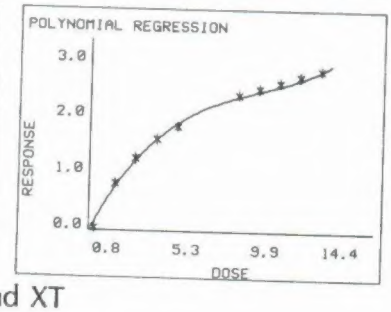

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connector, but their response was dramatic and prompt; I was impressed.

I do recommend that if your unit arrives without the BATT.DO file, be cautious with your data. Consider removing the unit and checking the batteries. Then, enjoy.

Rick Davidson
71646,1276

FAR EAST ENTOURAGE

Not only has the 100 become standard equipment for traveling reporters, but on President Reagan's recent trip to China, it became an essential tool. Many reporters carried EP-22 Brothers or EP-44s as printers because it was known in advance that while the 100 would transmit to home offices during the pre-China stops (California, Hawaii, and Guam), it wouldn't work once in Beijing.

The press room was awash with 100s hooked to Brothers in order to print out copy for the Telex operators. (The Chinese were said to be monitoring lines making phone transmission by 100s possible.)

It was noted that EP-22 owners were extremely jealous of reporters with EP-44s because of copy quality and the fact the 22s had to be run at 75 baud, while the 44s could go at 110.

Bruce Drake
CIS ID 71436,323

EASIER WITH MS-DOS

To file transfer, you suggest using LDOS (see *Portable 100*, June 1984, page 54). This can be done more easily using MS-DOS. To configure the 100 as your console device, simply type the information in exhibit 1 at the DOS prompt:

The first line opens a new file for console input. The file is called m100.bat, and will contain the instructions to accept the 100 as the console device. The next two lines are the only instructions needed by MS-DOS to divert screen and keyboard I/O to the 100. The third line is a control-Z to close the file. The last line invokes the 100 batch file. Now your 100 is the console for your desktop computer.

On the 100, enter TELCOM, press F3 for Stat and type in TELCOM: Stat 88E1E. Then press F4 for Term and press enter. You'll see the A prompt on your 100 screen. You can now experiment to see which programs can work with your 100 screen. I doubt any editor or spreadsheet would work, but you can upload and download text files with the copy command. To give control back to the desktop, simply type A>ctty con on the 100. To return control to the 100, type A>M100 on the desktop keyboard.

Operating-system facilities are wonderfully useful, but when LDOS and MS-DOS were written, the 100 didn't exist. File transfer by these means is at best clunky and is often user hostile. Only text files can be transferred, and there's no error checking. Even the simplest operating systems require dauntingly cryptic commands to set things up for communication, and if it doesn't work as promised, figuring out the problem can waste hours.

Michael Stanford
Portable Computer Support Group
Dallas, TX

```
A>copy con m100.bat
mode com1:96,e,8,1
ctty com1
^Z
A>m100
```

Exhibit 1: MS-DOS Transfer.

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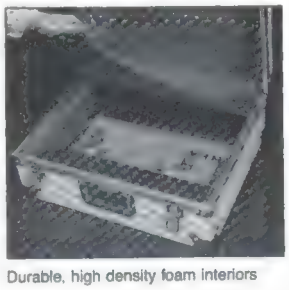

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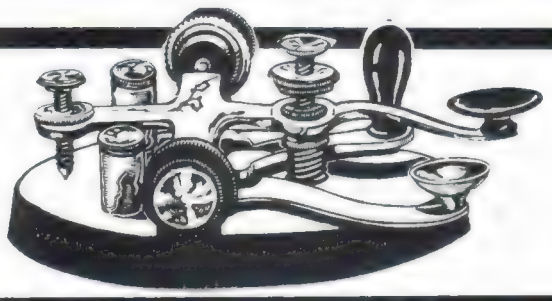

COMDEX-ATLANTA

DEEP SOUTH BECOMES WATERSHED FOR LAPPERS

By Mike Greenly and John Mello

Tandy President John Roach may have given the keynote address at Comdex-Atlanta, but Hewlett-Packard stole the show.

The manufacturer of the latest hot lap-sized computer, the HP-110, has pledged to be an aggressive force in the computer market and it used the spring computer dealers exposition in Atlanta to show it.

To woo the press, the California company set up a press room decked out with dozens of 110s. Want to test drive this Porsche of portables? Reporters were allowed to wheel one out for a day.

While Roach, who ramrods the enterprise that fueled the trend in portables with the introduction of the TRS-80 Model 100, addressed a sparse crowd, Hewlett-Packard held a press conference announcing a new agreement with Computerland to distribute HP computers and peripherals, and released a study by Inforcorp, a California research firm, claiming HP would be just behind Apple and IBM in sales of computers in the $1000 to $6000 price bracket.

Computers in that bracket would account for $12 billion in retail sales this year, the study said. The Big Blue, IBM, would have one-third of that market ($4 billion), Apple one-fifth ($2.5 billion), and Hewlett-Packard 6.1 percent ($748 million). Tandy was pegged with 5 percent of the market, Digital Equipment Corporation and NEC with 3 percent.

Also at the press session, HP cited consumer research indicating the firm's entry into the lap-portable market was increasing the public's perception of the company as a manufacturer of desktops.

"Almost everyone who uses a desktop computer wants, at some time or another, to take those capabilities away from the desk," HP Executive Vice President Paul C. Ely Jr. said. The 110's 272K of RAM, he added, is more than most desktops have. The 110 and HP's new $3495 laser printer are symbols of the firm's intention to be "among the key players in the personal computer market."

Roach admitted, during his address, technology isn't the driving force it used to be in the marketplace.

"Promotion is more important than technology these days," he said, adding the industry would spend $750 million to promote its products this year.

"Distribution is more important than technology," he continued. The real problem there, he explained, is sales people can only learn so many machines and so many software packages, so the limits of distribution are restrictive.

While there were familiar names like Hewlett-Packard and Tandy at Comdex, there also were many new companies. Some 53 percent of the exhibitors had never displayed their products at a Comdex before the one in Atlanta.

And there were some notable absentees. Apple, its marketing machine in high gear during the first quarter of this year, ignored the show. Kaypro was there, but its announced-but-unannounced IBM-compatible lap-sized computer to be manufactured by Mitsui wasn't.

The only new briefcase model announced at the show was by a member of the Old Guard of Computing, Morrow. It's portable entry, the "Pivot," comes with 16-line-by-80-column screen, one 5.25-inch double-sided disk drive, built-in 300-baud modem, and 128K of RAM. The 16-bit computer has an 80C86 processor and runs MS-DOS 2.x. Built-in software includes a word-processor, calculator, and clock.

Two of the machine's unique features are its fold-down keyboard and clock displaying a map of the world to enable a user to keep track of time anywhere.

Being a "hot" market, portables were given special treatment in their own seminar led by Gene R. Talsky, president of Professional Marketing Management Inc. Joining Talsky at the seminar were Chris Christianson, senior analyst at the Yankee Group, and David Kay, vice president for marketing for Kaypro. A similar seminar was held at the winter Comdex in Los Angeles (*Portable 100*, June 1984, page 11).

Tasky said the current portable market is very fluid. "Quicksand," he noted, "may provide a firmer foundation than today's market does."

He echoed Roach's remarks: "Today success means good marketing, not good product. There are an awful lot of products dying."

Christianson emphasized communications are a fundamental application for portable computers. In order for this market to grow, he contended, these micros' communications capability must grow also — even if it results in adding $1000 to the price of the machine.

He predicted in the next one to two years, tone pagers will be built-in lap computers telling a person he or she has a message waiting for them on CompuServe or The Source.

Those computers will also have more sophisticated spreadsheets, he added. Currently, he said, Convergent Technologies is working on moving Lotus 1-2-3 into its Workslate lap portable.

A hint that discontent with IBM may be infecting some industry members emerged during Kay's presentation at the seminar. He sparked scattered applause when he commented, "The bad news is, the industry is still confused.

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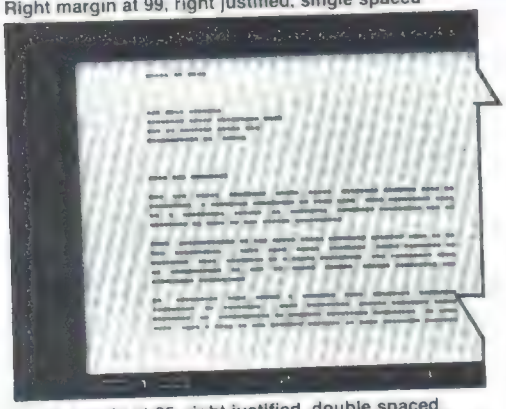

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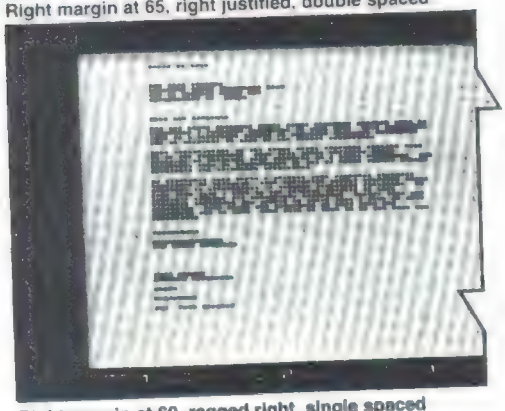

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IBM's steamroller tactics continue to inhibit industry innovation, motivation, and competition."

No show would be complete without its share of rumors. One gleaned from an "informed source" at Hewlett-Packard indicates Lotus's Symphony will be available in ROM form for the 110 before the end of the year. The upgrade is expected to cost $200.

In an attempt to stoke the rumor boiler, Steve Deering, a reporter covering the show for The Source, approached representatives of Digital Research, manufacturers of CP/M. Deering's report of the encounter went like this:

"'How is your relationship with IBM going along now?'

"'[Digital Research is] very, very happy with our relationship with IBM right now.'

"They said this with a grin on their faces so big that it made me think these guys are loving what is happening to them and that it is true 'CP/M is dead, long live CP/M.'

"So I said, 'You know, guys, rumor has it that you are providing IBM with their new operating system. Any truth to that?'

"With an even bigger grin, they said, 'We really cannot talk about that, but we are really very, very happy with our relationship with IBM.' "

Neither would a Comdex be complete without the introduction of nifty gadgets. One of the niftiest, a computer keyboard that recognizes its master's voice, was exhibited by Key Tronic Corporation.

The keyboard can be "trained" to respond to any dialect, accent, or language. Speaking into a microphone connected to the keyboard, a person responds verbally to prompts on a computer screen. This process, lasting about a minute, trains the keyboard to recognize the person's voice. Once that's accomplished, a person can manipulate the computer by talking to it.

A 100-word vocabulary of "macros" can be established for the keyboard by the user. This enables the user to get the machine to execute a series of commands at the sounding of a single word.

In a sense, spring Comdex represented a watershed in the young life of the lap portable market. The rising number of entries in the field shows portables are more than a journalist's tool or inventory-taker's gimmick.

All around Comdex, there were signs of portables coming into their own, portables with characteristics far beyond the capabilities of the Model 100. It made one realize how the Model 100 is increasingly becoming a nostalgic sign of the past, but also a window to the future. ◀

BRIEFS

Edited By John P. Mello Jr.

PRICE WARS

The sale some Tandy watchers predicted would last until the next generation of 100s is introduced ended June 1, and the old price structure — $999 for a 24K unit and $799 for 8K — took effect.

Meanwhile, NEC Home Electronics announced price cuts

on its PC-8200, a sister machine to the 100. NEC pegged the price of a 16K 8200 at $599 and a 24K unit with a 300-baud outboard modem at $799.

Those cuts were the *official* ones. Some discounters went further. A week before the announced price cuts, 47th Street Photo advertised 8200s in the *New York Times* at $419.95. And a company named Perscom in Columbus, OH, priced the machines at $350 for a day.

100 COFFIN NAIL FOR 1810

Xerox Corporation withdrew from the portable computer market by abandoning its model 1810.

Xerox justified its move by saying its supplier, Sunrise Systems, failed to deliver the computer on time and the final product didn't meet Xerox's quality specifications. Sunrise denies those accusations.

But *Personal Computers Today*, an industry newsletter distributed on the Newsnet network, reported Tandy's Model 100 may have been a key factor in the 1810's demise.

Analysts told the publication the 1810 from its inception lacked the necessary features to compete with the Model 100 and was considerably overpriced.

Those analysts noted the 100 has 8-line-by-40-column screen, while the 1810 had a 3-line-by-80 characters. The 100, which includes a text processor, was also $1000 less than the 1810, which needed add-ons for word processing.

ATEX OFFERS 100 SOFTWARE

Atex, a major provider of front-end systems for newspapers and magazines, recognized the impact the Model 100 has had on the newspaper industry.

At the American Newspaper Publishers Association exhibition, Atex introduced a full-featured, personal computer interface program. The software supports remote input,full-password security, and sending and fetching of files and messages.

The software also allows a remote computer to get all Atex directories, including global and selective directories.

Atex chose two computers to demonstrate the program at the show: the IBM PC and the Model 100.

NEW PROCESSOR FOR PORTABLES

Harris Corporation has introduced a CMOS version of the 8088 microprocessor used in the IBM PC. According to Harris the chip "offers the same high computational performance as the Intel 8088 for only 10 percent of the power consumption.

A portable computer built around the processor, Harris claimed, could be used anywhere and operate for up to two weeks without recharging the battery.

The 80C88 has a 16-bit internal architecture and interfaces with memory and peripherals via an 8-bit bus. It is the companion product to the 80C86, a 16-bit processor introduced by Harris a year ago and used by most 16-bit portables now on the market, including the Hewlett-Packard 110.

Full production of the chip is expected by Harris in the fourth quarter of this year. ◀

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BUSCH LEAGUE

DAVID BUSCH

AUTO PROGRAM — PART 4 TABBER CLEANS UP SLOPPY COMPUTER PENMANSHIP

This is the fourth in a series of columns by Dave showing Portable 100 *readers how to construct a program generator. The columns are based on* The Automatic TRS-80 *by Dave and published by Tab Books.*

Tabber is a simple, yet elegant and useful program. It doesn't create new program lines, doesn't make your computer operate 50 percent faster, and won't make your laundry whiter.

What it will do, though, is center automatically various prompts printed on the screen using print or input statements. Instead of sloppy screen formatting, you can have neat copy. And best of all, you only need to make one small change in your programming habits.

CENTER PROMPT. To center any prompt, simply type PRINT TAB(T) instead of calculating the proper tab position yourself. With messages to be printed to the screen, insert TAB(T). If a program presently includes the prompt after an input or line input statement, you'll have to do some rewriting. This is because the 100 has no such thing as an INPUTTAB(n) or LINEINPUTTAB(n) statement (see example 1).

You even can run programs using TAB(T) without running them through Tabber. This is especially useful during program development and testing. Simply insert TAB(T) as you go along. Until the finished program has been processed by Tabber, all prompts with TAB(T) will be printed flush left, as long as the variable T isn't used within your program.

If not, it'll have a value of zero, and the program will tab zero spaces for each prompt. Then, when the program is done, save it in ASCII form, and run Tabber. It'll search through each program line. When it finds TAB(T) it'll measure the length of the prompt remaining, calculate how many spaces must be tabbed to center that message on a 40-column screen, and replace the T with an appropriate number.

RUN TABBER. The user enters the filenames for the input and output files, and a single line is loaded from RAM for a run. The next line looks for an occurrence of TAB(T) in the target program line. Since the string TAB(T) is fairly unique, no effort is made to check to see if it's contained in quotes, or after a remark.

Odds are, it'll never appear in your program, except where you actually *do* want to center a prompt. This is mentioned because Tabber did crash when it was used to process itself. That happened because of line 150, in which TAB(T) is contained as part of the program and not before any prompt. In all other cases, TAB(T) will be followed by a prompt and a matched pair of quote marks. In this case, that was not so.

Whenever Tabber finds TAB(T), it looks for the position of the first quote, loads the value of the rest of the program line from that quote, and then cuts off the line *after* the second quote (line 190). B$ will then contain only the material in the prompt.

LINEAR MEASURE. The next step is to measure the length of the prompt, subtract that from 40, which is the screen width and divide by 2. The result, D, is the number of spaces that should be tabbed to center the prompt.

A new program line is then assembled in line 220, taking everything that appears *before* the TAB(, adding that to a string representation of the tab value (the leading space has been deleted in line 210), and finishing off with the rest of the program line, beginning with). Thus, the T has been deleted and replaced with a number.

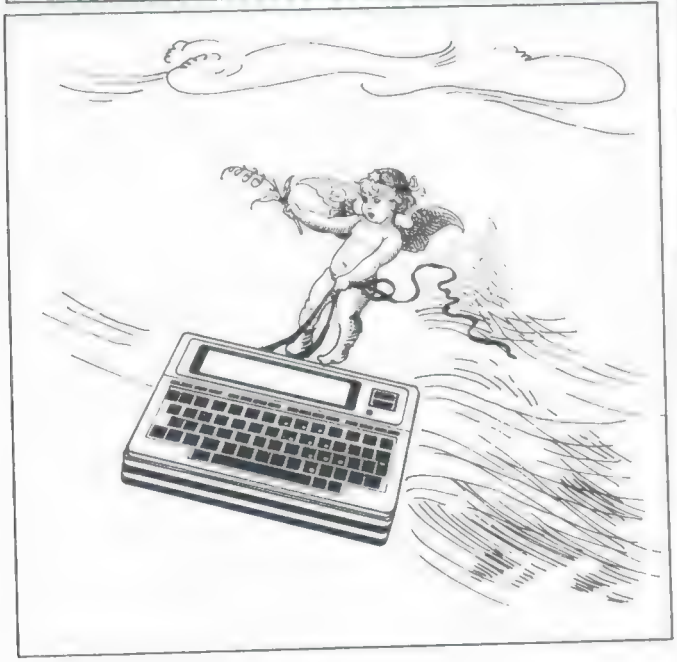
The program then loops back to line 150 to see if any more TAB(T)s appear in the program line. This allows Tabber to process multiple TAB(T)s appearing on a single line. Once the work is finished, or if a line contains no TAB(T)s, control drops down to line 240, where A$ is printed to disk and screen. A check is made in line 260 to see if the end-of-file has been reached. If not, the program loops back to line 140 to load another program line from disk. Otherwise, the processing is finished. ◀

```
WRONG:10 INPUT"Enter your name:";A$
RIGHT:10 PRINTTAB(T)"Enter your name:";:INPUT A$
```

Example 1. Tabber Statement.

BUSCH

```
 10 ' ********************
 20 ' *  *
 30 ' * Tabber *
 40 ' *  *
 50 ' ********************
 60 CLEAR 1000
 70 MAX FILES =2
 75 ' *** Open files ***
 80 CLS
    : PRINT
    : PRINT
 90 PRINT "ENTER PROGRAM WITH TABS TO
    BE CENTERED:"
100 LINE INPUT F$
110 F1$=LEFT$(F$,4)+"TB.DO"
120 OPEN F$ FOR INPUT AS 1
130 OPEN F1$ FOR OUTPUT AS 2
135 ' *** Process a file ***
140 LINE INPUT #1,A$
150 C=INSTR(A$,"TAB(T)")
160 IF C=0GOTO 240
170 C1=INSTR(C,A$,CHR$(34))+1
180 B$=MID$(A$,C1)
190 B$=LEFT$(B$,INSTR(B$,CHR$(34))-1)
200 D=INT((40-LEN(B$))/2)
210 D$=MID$(STR$(D),2)
220 A$=LEFT$(A$,C+3)+D$+MID$(A$,C+5)
230 GOTO 150
240 PRINT #2,A$
250 PRINT A$
260 IF EOF(1)GOTO 280
270 GOTO 140
280 CLOSE
285 ' *** File processed ***
290 CLS
    : PRINT "FINISHED."
300 PRINT
    : PRINT
310 PRINT "Process another file?"
320 PRINT "(Y/N) "
330 A$=INKEY$
    : IF A$=""GOTO 330
```



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THERE ARE ALTERNATIVES TO BURNING MIDNIGHT OIL WHEN CREATIVITY STRIKES

Every now and then I find myself in the middle of a large programming project. And I love it. But after many years of wearing out pencils and keycaps in the cause of this noble art, I still fall into a few of the same old traps.

What usually happens is I face a computing task requiring a certain amount of time to complete. A simple estimation will tell me whether or not I can save time or effort by writing a program to perform a task.

Everything is simple and logical up to that point. Assuming that my estimations are reasonably accurate, I can often save myself some time on a project. Even if I only break even, I'll at least have increased my flying time as a programmer, thus making me more proficient. But does it?

ADDICTED. Very often, when I write these one-off, custom-made programs I become addicted to the task. The program grows and grows.

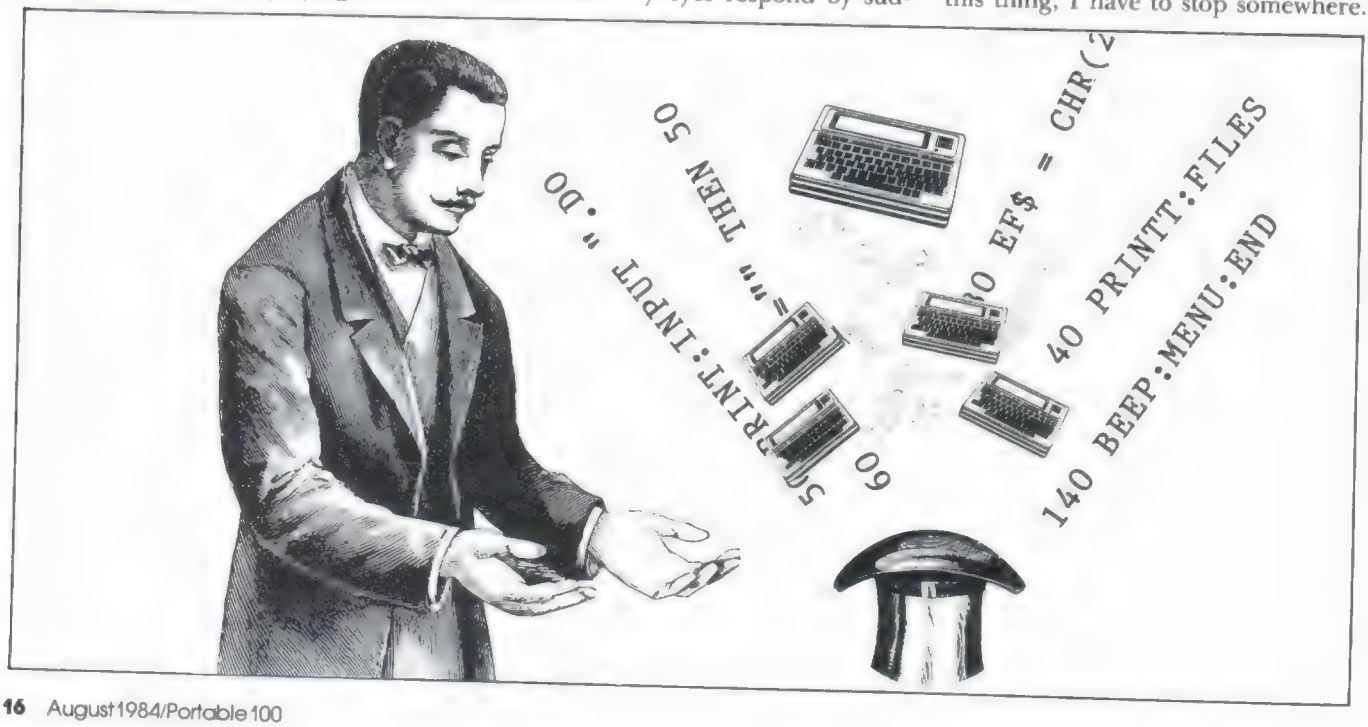
Within my allotted time frame, the program will be in a usable form. By that time however, something always seems to happen that I'm never able to schedule for at the beginning of the project — I suddenly get creative.

Before you know it, the inspiration comes flooding down from the heavens. A subsequent glance at the clock reveals its hands in an early-morning stance and my eyes respond by suddenly becoming bleary. The project now begins in earnest.

It's not difficult to see this could all be blamed on a lack of discipline and I often chastise myself for it. But how can I be fair to my own sense of creativity? What am I supposed to do — stifle it in the cause of being a good boy? No thank you. The results of my extended efforts are nearly always useful to me, more useful than the originally planned program. Apart from that, I enjoy it.

CREATIVITY. So what's to be done? Do I write the program I have in mind at the start of the project and accomplish my task with a few quick flourishes across the keycaps? Or do I allow my creative juices to flow unchecked, spend an inordinate amount of time, and finish up with an even more useful program than I intended? I almost shamefully admit I nearly always choose the latter.

But as someone making a living at this thing, I have to stop somewhere.



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Time is, after all, money. There must be some way to optimize the mix of productivity and creativity; some way to "design in" some discipline from the start.

Of course I have a suggestion for anyone sharing my problem, otherwise what would I be writing this for? The answer seems to be to acknowledge the problem from the start and do what many programmers already do: flowchart the program. What else?

For those of you who have learned programming by hands-on, head-on meetings with microcomputers, flowcharting may be something you've not considered.

What do all those boxes, diamonds, and lines mean? For a start they often mean a considerable savings in time with anything other than a very short program. For diehards like me, they offer a solution to the program that threatens to become a monster.

BAD FORM. You may have heard it said it's bad form to start a program at the keyboard. Strictly speaking, that's true. But what if it's a simple one- or two-liner? What if the function of the program is so simple and direct it would be a waste of time to invest time in program design on a piece of paper? In those circumstances, I'm afraid I'd start just like you're not supposed to ... at the keyboard.

The problem arises when the situation I've already described occurs — I find a couple of bells and whistles making the program less specific in its approach. Ergo, it will be more generally useful and will save me time in the future in some unforseen circumstance. By flowcharting first, however, I have a chance to see what monster the program might become. Instead of programming my way out of a labyrinth, I can design the labyrinth myself.

What a flowchart lets you do is see the overall flow and complexity of your program. By designing it first on a piece of paper, you get some idea of the time it's going to require to code it.

IDEAS UNCHAINED. Not only that, but your creativity remains unfettered. Any new ideas can be inserted much more easily into a flowchart than a program. Problems in logic flow can literally be seen before they occur.

That's the main strength of a flowchart. It separates the logical design of a program from the actual mechanics of coding. There's no need to take into account which variables do what. Ideas can be incorporated as they occur thus freeing up the creative process and separating it from the logical process. The left and right hemispheres of your brain can remain friends.

Whenever I realize the project I'm about to embark on should be tackled via a flowchart, I write tighter, prettier code and the program is finished faster.

And no amount of commenting within the code beats the clarity of a flowchart. If you need to write the same program in Pascal instead of Basic, just take that flowchart and code it from scratch. The creativity and impeccable logic are frozen within the skeleton presented by that flowchart.

I hope I've convinced some of the "free-form" souls out there that there are ways of imposing discipline without sacrificing creative freedom. The simple application of lines, rectangles, and diamonds to paper can free you from yourself. ◀

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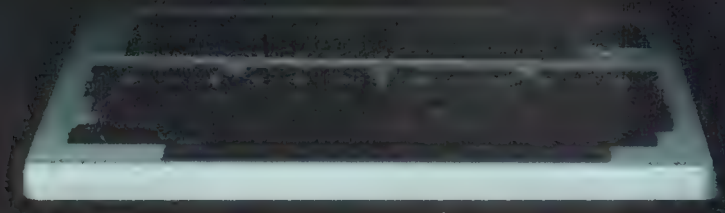

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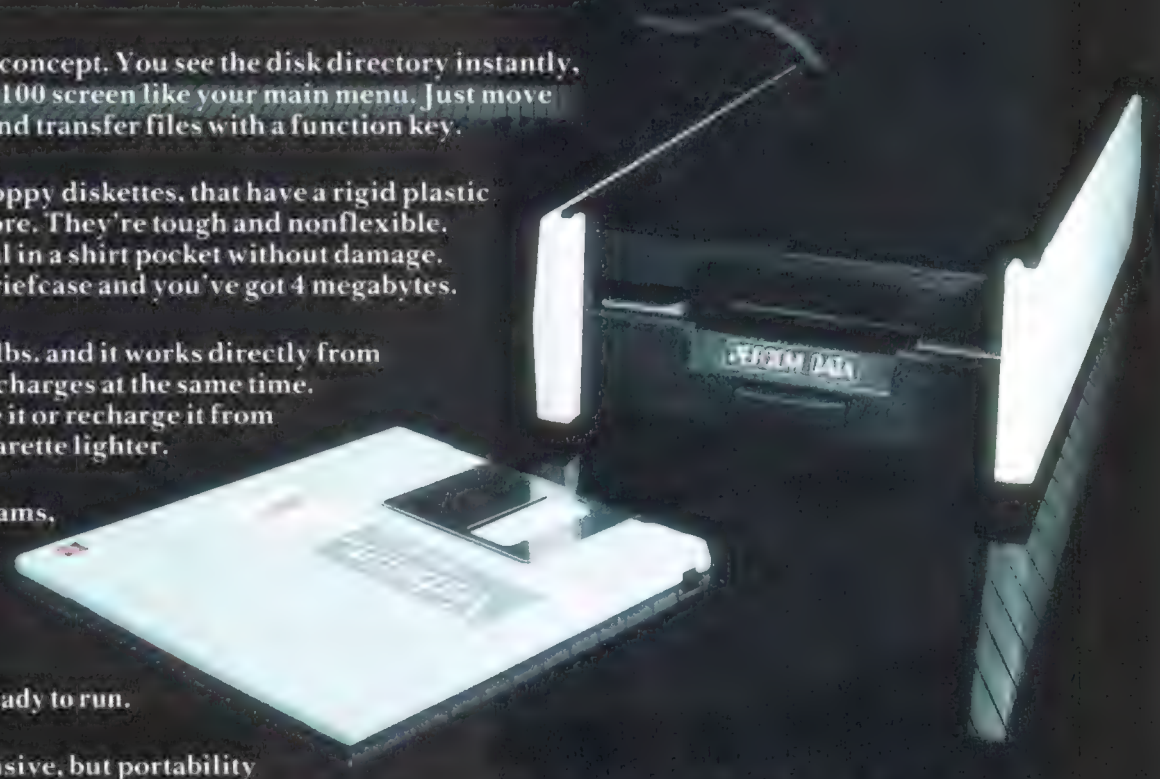

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TELECOMPUTING

BILL LOUDEN

GETTING TANDY'S MIGHTY MITE TO TALK TO ITS MS-DOS FLAGSHIP

I thought I would depart a little this month from covering available data bases and discuss transferring files from your Model 100 to another microcomputer.

I just purchased a Tandy 2000 and the need quickly surfaced to use it to store my Model 100 files. Transferring files from the Model 100 to the Tandy 2000 is easy with two Basic programs.

I carry my Model 100 with me almost everywhere. I use it to write memos at work, on airplanes, or when the fish aren't biting in the mountains of Colorado. But when I get back home, I prefer to upload my document files to my Tandy 2000 for storage.

I wrote two simple Basic programs to transfer files from my Model 100 to the 2000. You will need a null-modem adapter from Radio Shack (26-1469, $29.95) and a DB-25 to DB-25 cable.

MEWS TO 2K. First, the Model 100 program (program listing 1). Lines 10–20 set up the initial parameters. To transfer the file, you will need two files. One for the input file on the Model 100; the second for the output to be sent over the communications line.

Lines 30–40 prompts you for the file name (with .DO extension) that you will transfer from the Model 100.

Line 40 opens that file (F$) for read only input as file 1.

Lines 50–60 open the communications line as file 2. I chose "COM: 68N1E" for 2400 baud, 8-bit word, zero parity, and 1 stop bit. The final "E" will put the Model 100 in the XON/XOFF protocol which will ensure that one computer will not transfer too fast for the other computer.

Now that the files are opened, lines 80–120 actually do the file transfer.

Line 80 inputs a line at a time from the file and line 100 outputs that line to the Tandy 2000.

When the end of file is detected in line 110, the program will send a CHR$(26) (control-Z) as an end of file marker to the Tandy 2000.

Line 140 closes the Model 100 file and ends the program normally.

BACK AGAIN. The Tandy 2000 program is very similar (listing 2). Lines 30–40 prompt for the file name and extension and opens that file for output "O" as file 2.

Lines 50–60 opens the communication line on the Tandy 2000 for 2400 baud, 8 bits, zero parity and one stop bit. The ASC expands tabs to spaces, forces a carriage return at the end of each line, and recognizes control-Z, CHR$(26), as the end of file marker.

Line 60 prints that the Tandy 2000 is awaiting the data from the Model 100.

```
10 MAX FILES =2
   : CLS
   : CLEAR 500
20 ESC$=CHR$(27)
30 PRINT
   : INPUT "Enter file.do";F$
40 OPEN "RAM:"+F$ FOR INPUT AS 1
50 O$="COM:68N1E"
60 OPEN O$ FOR OUTPUT AS 2
70 PRINT ESC$;"p Transferring file ";
   ESC$;"q"
80 LINE INPUT #1,A$
90 PRINT A$
100 PRINT #2,A$110IF EOF(1) THEN 120
   ELSE 80
120 PRINT #2,CHR$(26)
130 PRINT ESC$;"p File Transfer
   completed ";ESC$;"q"
140 CLOSE
   : END
```

Program Listing 1. Model 100 to 2000.

```
 10 CLEAR 2000
 20 CLS
 30 INPUT "Enter Filename : ";F$
 40 OPEN "O",2,F$
 50 OPEN "com1:2400,n,8,1,ASC" AS 1
 60 COL OR 0,7
     : PRINT " Waiting for COM "
     : COL OR 7,0100B$=""110IF EOF(1)
     THEN 160
120 LINE INPUT #1,B$125IF A$=CHR$(26)
     THEN 160
130 PRINT B$;CHR$(0)
140 PRINT #2,B$
150 GOTO 100
160 CLOSE
170 COL OR 0,7
     : PRINT " File transfered "
     : COL OR 7,0
180 END
```

Listing 2. Model 2000 to 100.

Lines 100–150 input a line at a time from the Model 100.

If a control-Z is detected in line 110, the program branches to line 160, where the Tandy 2000 closes the file, prints the completion message, and ends the program.

Line 130 prints the line received on the Tandy 2000 screen; the CHR$(0) is a line terminator.

Line 140 prints the line to the Tandy 2000 file. Note CHR$(0) is not needed here as the carriage return is sufficient.

LIMITS. The only limitation to this program is the file cannot have line lengths greater than 255 characters. Basic will truncate strings greater than 255 characters to the first 255 characters.

Basic programs can be transferred easily using these two programs, but the Model 100 Basic program must be saved with the ",A" extension prior to being sent to the Tandy 2000.

The Tandy 2000 program should work on the IBM PC or any other MS-DOS computer running MicroSoft's GWBASIC. ◀

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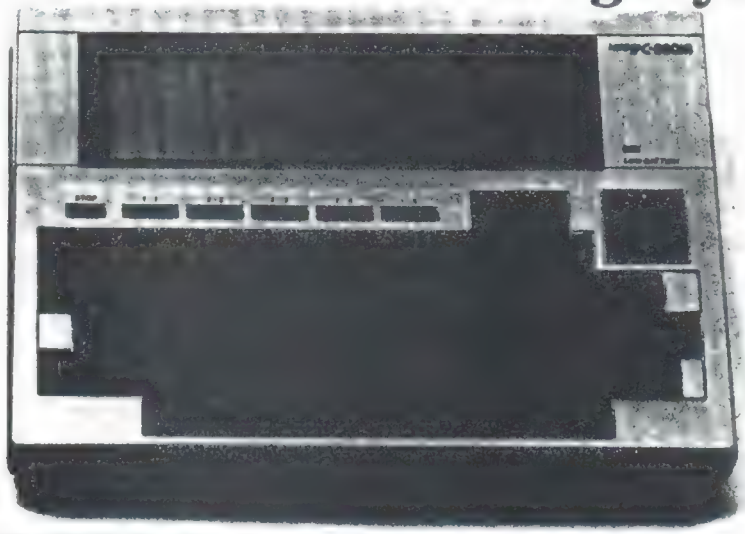

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BOTTOM LINE

BILL WALTERS

SPECTACULATOR HELP AND SOME WORTHWHILE TIPS ON MANAGING HIGH MEM

You may have noticed this column has a new title. The reason is due to my departure from Radio Shack. Quite a change for me. I'm now working for a major airline.

Since I'm no longer directly affiliated with Radio Shack, I would like to change the tone and viewpoint of this column. It may take me a while to get there, but I intend to review products related to the Model 100 (from Radio Shack and other sources), as well as cover business uses which might not be obvious at first glance.

Radio Shack has been delivering a spreadsheet program for about a month or two (hopefully). It's called Spectaculator and for $49.95, it's a great buy.

Written in machine language, the program is very fast and compact (7960 bytes). Also, there is an optional help file. It can be loaded and used by a question mark. It takes 2260 bytes. If you don't want to have it loaded, you'll get a beep and a message to let you know Spectaculator can't use it.

HELP FOR HELP. Unfortunately, the manual is not clear on loading the file. Let's look at the steps necessary to get Spectaculator and the help file loaded into your Model 100. First, enter BASIC and type:

```
CLEAR 256, 55000
```

This will reserve 256 characters for "string" space and set aside memory locations 55000 and higher as a "protected" area. The area cannot be accessed by any program until you issue a new memory allocation with another clear command.

Set up your tape recorder, rewind the tape to the beginning, and type:

```
CLOADM "SP.CO"
```

This command loads a machine-language program from tape and places it at the memory address specified by a series of characters given on the tape itself. When the program is found you'll see:

```
FOUND: SP
Top: 55000
End: 62960
Exe: 55000
```

Also, if you didn't type CLEAR 256, 55000 you will see: ?OM Error. That means your Model 100 can't load the program into memory because you haven't reserved enough space for it. Nothing too bad, just type CLEAR 256,55000 and then try again.

After loading, the OK prompt will reappear. At this point, you have Spectaculator stored in executable form up in high memory. It will not appear on your main menu. So, you ask, how do I get this thing to work? Two ways. First, you can enter BASIC and type:

```
CALL 55000
```

This will cause BASIC to execute a machine-language call to the address where Spectaculator begins. This is okay, but if you're like me, you won't remember the address to use. Relax, there's a simpler way. Try this:

```
10 CALL 55000
SAVE "SP.BA"
```

Now you have a one-line program on your menu and by running it, Spectaculator will be at your command.

SHARING .CO SPACE. All well and good, but I happen to have several machine-language programs. I want access to all of them. That means I want each to appear on the main menu so I can load them at any time. Remember, if machine-language programs share the same address, you can use only one of them at a time.

Use SAVEM to save Spectaculator in the file storage area:

```
SAVEM "SP.CO",55000,62960,55000
```

Right now, you have two copies of the program stored in memory. One is in locations 55000 to 62960. The other is in the "floating" file storage area and its location will vary (see "Tandytalk," *Portable 100*, January 1984, page 16).

Now let's reclaim the upper area of memory With a CLEAR command:

```
CLEAR 256,MAXRAM
```

Notice I used MAXRAM instead of 62960. This is a shortcut. The Model 100 always knows what its upper memory limit is. You can see it by typing in Basic: PRINT MAXRAM.

Again, this is done from BASIC. Since it's cumbersome to renumber all this stuff, lets make it easier by making a one-line program do it:

```
10 CLEAR 256,MAXRAM : MENU
SAVE "RESET.BA"
```

This sets up a program to reset the memory and jump back to the main menu.

You're not done yet with one-liners! Since Spectaculator isn't at an executable address, you have to do the following to run it:

```
CLEAR 256,55000
LOADM "SP.CO"
CALL 55000
```

You can shorten the program by using RUNM:

```
CLEAR 256,55000

RUNM "SP.CO"
```

That's a lot to do each time you want to run your program. Let's let the 100 do it:

```
10 CLEAR 256,55000:RUNM "SP.CO"
SAVE "SP.BA"
```

Now the main menu will display a machine-language "SP" file (SP.CO) and a

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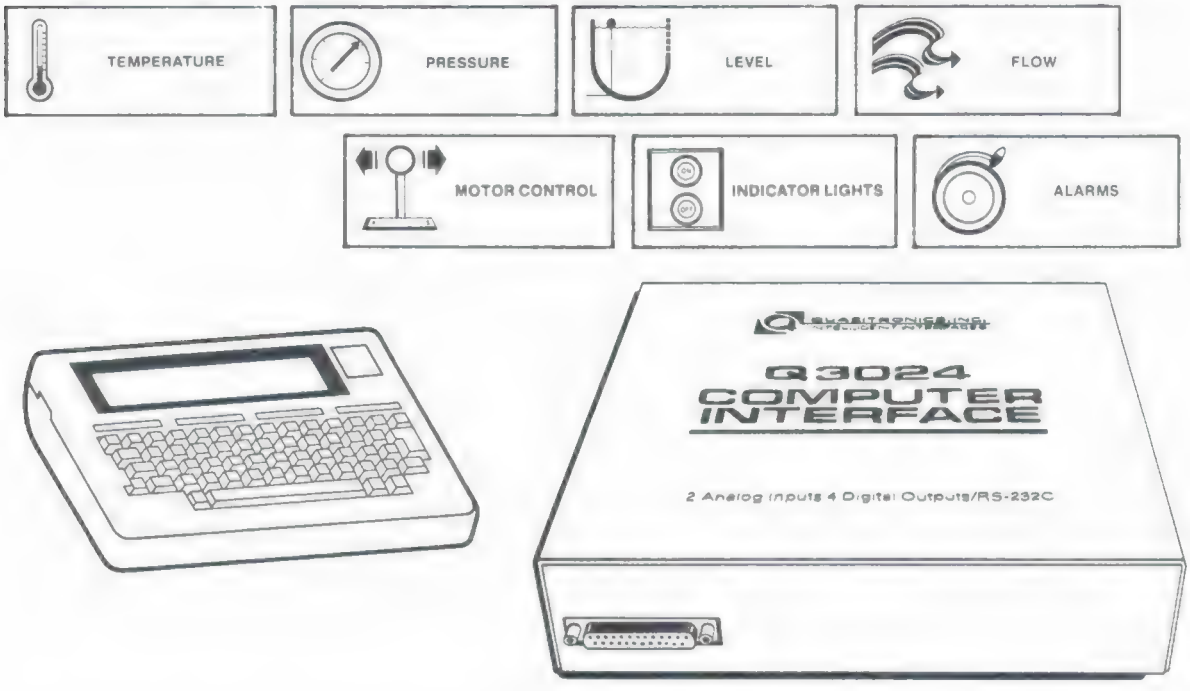

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```
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   CLOADM "SP.CO"
   (after loading is complete)
   SAVEM "SP.CO",55000,62960,55000
Now, exit BASIC and enter TEXT
Answer "File to edit" with:
   SPHELP
Press function key F2 (load)
Answer "Load from:" with:
   SPHELP
After loading is complete, exit back to
the main menu and you'll see two new
FILES SP.CO and SPHELP.DO.
```

Exhibit 1. Loading Help and Spectaculator.

```
10 CLEAR 256,55000
:LOADM "SP.CO"
:KILL "SP.CO"
:CALL 55000
 SAVE "SP.BA"
```

Program Listing 1. Load, Execute, Erase.

```
10 SAVEM
"SP.CO",55000,62960,55000
20 CLEAR 256,MAXRAM
   :MENU
   SAVE "RESET.BA"
```

Listing 2. Restore File Copy and Reclaim High Memory.

Basic one (SP.BA). If you want to get fancier, you can have the Basic program load the machine-language file into high memory and erase the filespace copy (program listing 1). This will free up 7,960 bytes.

CHANGE RESET.BA. You'll have to change RESET.BA to create a new menu copy of the program (listing 2). The only problem with this approach is this program will stop execution when it completes SAVEM (line 10). You then have to say RUN 20 to finish up.

Be aware that if you make a big enough spreadsheet in Spectaculator, you may not be able to save a filespace copy, so don't reset upper memory unless you're prepared to reload the program from cassette tape the next time you want to use it.

Phew! All that work and I still haven't told you how to load the help file! We know how to load a Basic and machine-language program; however, the help file is text file, so you must go to TEXT to load that!

Exhibit 1 has all the steps necessary to load Spectaculator (SP.CO) and its

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help file (SPHELP.DO). The steps shown assume you wish to save a file-space copy of the Spectaculator program. Be sure you lock your caps key when you type in SPHELP. If you don't, Spectaculator will be unable to find the help file and think you haven't loaded it.

Remember, while I have discussed the specifics of the Spectaculator program, these techniques will work with any machine-language programs; all you have to do is adjust the address locations appropriately.

I would like to close this month's column with a request. These articles are intended to be for your interest and help. If you have comments, things you would like to have discussed, new items to talk about, or different ways you use your Model 100 that might be of interest to others, I'd like to hear from you. ◀

Bill Walters is a pilot for American Airlines and formerly the Model 100 buyer for the Tandy Corporation. His mailing address is 2925 Conejos, Ft. Worth, TX 76116. He also can be reached via CompuServe (70007,265).

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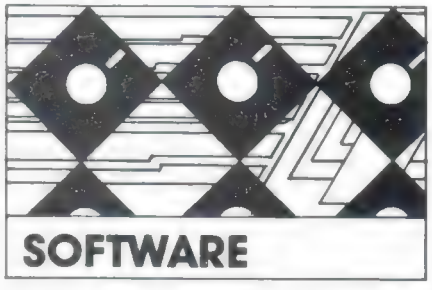
FUNKEY STUFF — 2: CALCULATING FILE SIZE AND MORE

Now that you're familiar with RFU's skeleton, Jesse shows you how to put some meat on the bones.

By JESSE BOB OVERHOLT

Welcome back! In the last installment I introduced RAM File Utility (RFU), a marvelous Basic program that duplicates most of the functions of the Model 100's menu in just a few thousand bytes. Before I start installing features into RFU, it's necessary to go back and tidy up its foundation.



BACKGROUND. As mentioned before, the subroutine at 50000 which reads the RAM file directory is crude, even though it gets the job done. The real problem, though, is that we want to know how long files are and that information isn't available using this subroutine. Therefore, 50000 must be replaced with a more comprehensive subroutine. Those of you who wrote it down in ink instead of pencil will recall that I warned you it would be changed. Spare me your tears! Refer to Listing 1, which contains the entire RFU program complete with all changes from last time.

In order to get all the information we need on each file it's necessary to go to the directory itself. In line 50010 a FOR-NEXT loop is set up to march through the directory. Note the use of an integer loop variable for speed. Due to the limitations on integer values, you must enter the loop values as negative numbers. (To obtain the true address just add 65536 to each number.) The purpose of this loop is to extract the name and address of each file and return them in arrays FL$ (names) and FL! (addresses). For reasons to become apparent later, these entries must be in the same order as the files are situated in RAM.

Each directory entry begins with a one-byte status code. Line 50020 skips inactive or unused directory entries, which have the most significant bit set to 0. Files in ROM are bypassed in line 50030.

ONE-LINER. By the time we reach line 50040 we know there's a *live* entry that we want. At that point we add 1 to NF (number of Files) and get the RAM address of the file (AD!) from the second and third bytes of the directory entry. If this is the first file found we then skip to line 50060.

A simple one-line sort is contained in line 50050. Well, it isn't actually a sort, but a routine which inserts each array element in correct order. Lines 50060 to 50080 pick up the file name. Note the use of MID$ to build the name instead of the usual "X$=X$+..." method. I chose this because it causes less trashing of string space and is generally quicker.

When the loop finishes we wind up at line 50100. There the next free RAM address is tucked away in the last element of the FL! array. Variable PB! is plugged with the address of the paste buffer. This may not seem like an important address to know, but not knowing it caused me endless grief during the development of RFU.

FILE SEARCH. Prior to leaving this routine, it's necessary to make sure that we found at least one file. This may seem silly, since one might assume the directory would at least contain an entry for RFU itself. Murphy was an optimist, though, so we check for a no-file condition just in case.

Most of the subroutines in RFU with line numbers 50000 and above can be used in programs of your own design. Reading the RAM file directory can be accomplished with subroutine 50000. It requires external definition of the two arrays (FL$ and FL!). The returned values are NF (number of RAM files found) and arrays FL$ (names of files in RAM) and FL! (addresses of those files). You might wish to end line 50090 with a return and omit lines 50100 through 50130. This step would allow your program to do its own no-files check.

Subroutine 51000 requires the directory to have been read by 50000. It simply displays all files on the LCD and returns. No values are returned. Added routines are from lines 55000 to 56030 and lines 9000 to 9940. These routines are fairly simple and need no explanation. An ON ERROR GOTO was added to the end of line 110. Lines 51020 and 51030 were added to include free RAM in the menu display. Finally line 51050 was modified to the functions added in this installment.

ADDING FUNCTIONS. Here's the part of the course you signed up for. I know it's been tough going through all the preliminaries. They were necessary, though, so you'll be able to modify RFU for your own needs, and also so you'll be able to use the tools of RFU in programs of your own design.

The first function we will add to RFU is the one that should have been included in the 100 in the first place. I refer to the ability to see how long a given file is.

We will set up the "size" function to be invoked by the F1 key. Therefore it must begin at line number 1000. The first order of business, at line 1010, is to lock out other interrupts. This is done

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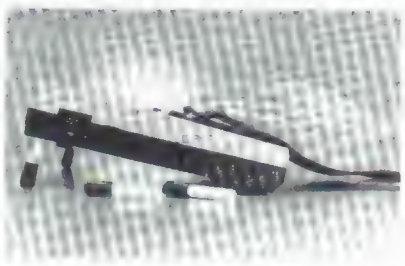

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using KEY OFF. As explained in Part 1, this is to prevent nesting of interrupts. Next the screen is cleared and the file name and address displayed.

PASTE BUFFER. In line 1030 subroutine 54000 is called. This little gem computes the file length. Since the file addresses in array FL! are in ascending order this should simply be a matter of calculating the difference between a file's address and that of the next file. When I did it this way, however, I sometimes came up with a length that was one byte longer than the file. After much fumbling, farkling, and some spectacular system crashes, I determined that this problem always occurred on the last document file.

A little research revealed the last document file to lie just below the paste buffer. This buffer is one byte long, even when empty. (The paste buffer always is empty when running RFU. This is done by the "MAXFILES=" statement.) To solve the problem I created a subroutine to calculate file length. It gets the address of the next higher file, in 54010, and then checks to see if the paste buffer lies between that file and the one we're interested in. If it is, then the paste buffer address is used for calculation.

Lines 1040 to 1060 perform a public service for hard-core SIG addicts. They calculate and display the time necessary to upload a document file using TELCOM and the built-in modem. It should be noted that this time is based on a total of 10 bits per character. If you use 2 stop bits, the time will be about 10 percent lower.

Lines 1100 and 1110 wrap things up. In 1100 we call a subroutine to wait for the enter key to be pressed. This is done so the user will have time to read the display, dump it to a printer, take snapshots, or whatever. Then we call 51000 to redisplay the menu and 52000 to reselect the file that was highlighted when F1 was pushed. Finally we return. Note that we never do a KEY ON in this routine. That is handled automatically in line 310 when we return.

BETTER PRINTING. Giddy from my success in displaying file sizes, I turned to the second major deficiency of our porta-puter. The barn-burner here is the meager print capability for document files. Now I know a number of folks are putting their kids through college by selling word-processing programs for the 100. I'm not talking about anything that extensive (or expensive), just a simple utility that could print a file in pages with margin control. Lines 2000 through 2910 are the product of my efforts. This routine is used to list the file selected by the cursor on the menu. Variable IX always points to the file in FL$ (and FL!) whose name is under the cursor on the menu.

Again we open with the traditional KEY OFF to prevent surprises. Next, in 2020, we check for some misguided lunatic trying to list a Basic or machine-language file. Sorry gang, document files only. Line 2030 is an example of democracy in action. You get to choose

Program Listing 1. RFU Version 2.0.

```
  1 'RFU by Jesse Bob Overholt
  2 'version 2.00
100 'Initialization
110 CLEAR 800
      : MAX FILES =2
      : DEFINTA-Z
      : ON ERROR GOTO 9900
120 DIM FL$(25)
130 ES$=CHR$(27)
      : RV$=ES$+"p"
      : NV$=ES$+"q"
      : CL$=ES$+"K"
      : CF$=ES$+"J"
140 CC$=CHR$(29)+CHR$(28)+CH
    R$(30)+CHR$(31)+CHR$(13)
```

```
190 ON KEY GOSUB 1000,2000,3000,4000,
     5000,6000,7000,8000
200 'Read directory & display it
210 GOSUB 50000
220 GOSUB 51000
     : IX=1
230 X$=RV$
     : GOSUB 52000
300 'Select file & get function
310 PRINT @0,DATE$ ;" ";DAY$ ;" ";
     TIME$ ;
     : KEY ON
     : X$=INKEY$
     : IF X$="" THEN 310
320 CC=INSTR(CC$,X$)
     : IF CC=0 THEN 310
     ELSE KEY OFF
     : X$=NV$
     : GOSUB 52000
330 PRINT @240,CL$;
     : ON CCGOSUB 400,500,600,700,800
340 X$=RV$
     : GOSUB 52000
     : GOTO 300
400 'Cursor left
410 IF IX>1 THEN IX=IX-1
     ELSE IX=NF
420 RETURN
500 'Cursor right
510 IF IX<NF THEN IX=IX+1
     ELSE IX=1
520 RETURN
600 'Cursor up
610 IF IX>4 THEN IX=IX-4
620 RETURN
700 'Cursor down
710 IF (IX+4)<=NF THEN IX=IX+4
720 RETURN
800 IF RIGHT$(FL$(IX),2)="BA" THEN
     RUN FL$(IX)
810 IF RIGHT$(FL$(IX),2)="DO" THEN X$=
     "Menu"+CHR$(13)+FL$(IX)+CHR$(13)
     : GOSUB 53000
     : CLS
     : END
820 RETURN
1000 'F1 - File size
1010 KEY OFF
1020 CLS
     : PRINT "File: ";RV$;" ";FL$(IX);
     NV$;TAB(20);"Location: ";FL!(IX)
1030 GOSUB 54000
     : PRINT
     : PRINT "File size: ";LN;"bytes."
```

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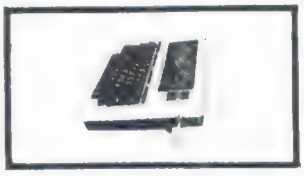

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```
1040 IF RIGHT$(FL$(IX),2)<>"DO" THEN
     1100
1050 X=INT(LN/30+.5)
     : L=INT(X/60)
     : X=X-L*60
1060 PRINT
     : PRINT "Time to upload: ";L;
     "Min.";X;"Sec."
1100 X$="to continue."
     : GOSUB 55000
1110 GOSUB 51000
     : X$=RV$
     : GOSUB 52000
     : RETURN
2000 'F2 - List a file
2010 KEY OFF
2020 IF RIGHT$(FL$(IX),2)<>"DO" THEN
     9000
2030 PRINT @240,CL$;"List to <D>isplay
     or <P>rinter? < >";
2040 PRINT @240+POS(0)-2,"";
2050 X$=INPUT $(1)
     : L=INSTR("DPdp",X$)
     : IF L=0 THEN 2050
2060 IF L>2 THEN L=L-2
     : X$=MID$("DP",L,1)
2070 PRINT X$;
     : AD!=FL!(IX)
     : CLS
     : ON LGOTO 2100,2200
2100 GOSUB 2800
     : FOR I=1 TO 500
     : NEXT I
     : CLS
2110 X=PEEK(AD!)
     : AD!=AD!+1
2120 IF X=26 OR INKEY$ =ES$ THEN PRINT
     : GOTO 2900
2130 IF X<33 THEN PRINT CHR$(X);
     : GOTO 2110
     ELSE X$=""
2140 X$=X$+CHR$(X)
     : X=PEEK(AD!)
     : AD!=AD!+1
     : IF X>32 THEN 2140
2150 I=40-POS(0)
     : IF LEN(X$)>I AND LEN(X$)<40
     THEN PRINT
2160 PRINT X$;
     : GOTO 2120
2200 CLS
     : P=66
     : T=3
     : B=3
     : L=64
     : M=8
2210 PRINT "Page length (lines) [";P;
     "]";
     : INPUT P
2220 PRINT "Top margin [";T;"]";
     : INPUT T
2230 PRINT "Bottom margin [";B;"]";
     : INPUT B
2240 PRINT "Line length [";L;"]";
     : INPUT L
```

```
2250 PRINT "Left margin [";M;"]";
     : INPUT M
2260 GOSUB 2800
     : GOSUB 2430
2300 X=PEEK(AD!)
     : AD!=AD!+1
2310 IF X=26 OR INKEY$ =ES$ THEN 2500
2320 IF X=13 THEN GOSUB 2400
     : X=PEEK(AD!)
     : AD!=AD!+1
     : IF X=10 THEN 2300
     ELSE 2310
2330 IF X<33 THEN LPRINT CHR$(X);
     : GOTO 2300
     ELSE X$=""

2340 X$=X$+CHR$(X)
     : X=PEEK(AD!)
     : AD!=AD!+1
     : IF X>32 THEN 2340
2350 I=L-LPOS(0)+M
     : IF LEN(X$)>I AND LEN(X$)<L
     THEN GOSUB 2400
2360 LPRINT X$;
     : GOTO 2310
2400 LPRINT
     : C=C-1
     : IF C>0 THEN 2460
2410 IF B=0 THEN 2430

2420 FOR I=1 TO B
     : LPRINT
     : NEXT I
2430 IF T=0 THEN 2450
2440 FOR I=1 TO T
     : LPRINT
     : NEXT I
2450 C=P-T-B
2460 LPRINT SPACE$(M);
     : RETURN
2500 C=C+B
2510 IF C>0 THEN LPRINT
     : C=C-1
     : GOTO 2510
2520 GOTO 2900
2800 PRINT @280,"Push <ESC> to stop.";
2810 RETURN
2900 X$="for menu."
     : GOSUB 55000
2910 GOSUB 51000
     : X$=RV$
     : GOSUB 52000
     : RETURN
3000 'F3 - Make a memo
3010 KEY OFF
3020 IF RIGHT$(FL$(IX),2)<>"DO" THEN
     9000
3030 OPEN FL$(IX) FOR APPEND AS 1
3040 PRINT #1,STRING$(39,"-")
3050 PRINT #1,DAY$ ;"  ";DATE$ ;"  ";
     TIME$
3060 CLOSE
     : GOTO 810
4000 'F4 Service Routine
4010 RETURN
```

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```
5000 'F5 Service Routine
5010 RETURN
6000 'F6 Service Routine
6010 RETURN
7000 'F7 Service Routine
7010 RETURN
8000 'F8 - Menu
8010 MENU
9000 'DO file error trap
9010 PRINT @240,CL$;"The file must be
     a .DO file!";
9020 BEEP
     : RETURN
9900 'General error trap

9910 CLS
     : PRINT "**** Error trap taken!
     ****"
     : PRINT
9920 X=ERR

     : IF X>22 THEN X=X-27
9930 X=(X-1)*2+796
     : PRINT CHR$(PEEK(X));C
     HR$(PEEK(X+1));" error in line";
     ERL
     : PRINT
9940 X$="to restart."
     : GOSUB 55000
     : RUN
50000 'Read RAM Directory
50010 NF=0
     : FOR X=-1694 TO -1441 STEP 11
50020 IF PEEK(X)<128 THEN 50090
50030 IF (PEEK(X) AND 24)>0 THEN 50090
50040 NF=NF+1
     : AD!=PEEK(X+1)+PEEK(X+2)*256
     : P=NF
     : IF P=1 THEN 50060
50050 P=P-1
     : IF AD!<FL!(P) THEN FL!(P+1)=
     FL!(P)
     : FL$(P+1)=FL$(P)
     : GOTO 50050
     ELSE P=P+1
50060 FL!(P)=AD!
     : X$="."  "
     : FOR I=9 TO 10
     : MID$(X$,I-7,1)=CHR$(PEEK(X+I))
     : NEXT I
     : L=8
50070 IF PEEK(X+L)=32 THEN L=L-1
     : GOTO 50070

50080 X$=STRING$(L-2,32)+X$
     : FOR I=3 TO L

     : MID$(X$,I-2,1)=CHR$(PEEK(X+I))
     : NEXT I
     : FL$(P)=X$
50090 NEXT X
50100 FL!(NF+1)=PEEK(64434)+PE
     EK(64435)*256
     : PB!=PEEK(63909)+PEEK(63910)*256
50110 IF NF>0 THEN RETURN
50120 CLS
     : BEEP
     : PRINT @176,"NO FILES"
50130 X$="for Menu."
     : GOSUB 10000
     : MENU
51000 'Display directory
51010 CLS
     : PRINT DATE$ ;" ";DAY$ ;" ";
     TIME$ ;
51020 X!=HIMEM -FL!(NF+1)-(MAX FILES
     +1)*267-16
51030 PRINT "   Free RAM:";X!;
51040 L=1
     : FOR I=1 TO NF
     : PRINT @L+40,FL$(I);
     : L=L+10
     : NEXT I
51050 SCREEN 0,0
     : PRINT @280,"Size List Memo
                   Menu";
51060 RETURN
52000 'Highlight selected file
52010 FL$=" "+FL$(IX)+SPACE$(9
     -LEN(FL$(IX)))
52020 PRINT @(IX-1)*10+40,X$;FL$;NV$;
52030 RETURN
53000 'Keyboard simulation subroutine
53001 '  Input: X$ contains keyboard
53002 '         entries to be simulated.
53010 X$=LEFT$(X$,32)
     : FOR I=1 TO LEN(X$)
53020 X!=(I-1)*2+65451
     : POKE X!,ASC(MID$(X$,I,1))
     : POKE X!+1,0
53030 NEXT I
     : POKE 65450,LEN(X$)
53040 RETURN
54000 'Calculate length of file
54010 X!=FL!(IX+1)
     : IF FL!(IX)<PB! AND PB!<X! THEN
     X!=PB!
54020 LN=X!-FL!(IX)
     : RETURN
55000 'Wait for <ENTER>
55010 PRINT @280,CL$;"Push <ENTER> ";X$;
     : BEEP
55020 IF INPUT $(1)<>CHR$(13) THEN 55020
55030 RETURN
56000 'Get Y/N response
56010 PRINT " (Y/N)? < >";
     : PRINT @CSRLIN *40+POS(0)-2,"";
56020 X$=INPUT $(1)
     : X=INSTR("YNyn",X$)
     : IF X=0 THEN 56020
     ELSE IF X>2 THEN X=X-2
56030 X$=MID$("YN",X,1)
     : PRINT X$;
     : RETURN
```

whether you want to list the file on the LCD screen, or on your favorite printer. The code to get this choice is simple, but may not be obvious. I'll let you have the option of accepting it in blind faith, or working it out so you understand it.

Lines 2100 to 2160 display the file on the screen. There's not a lot of magic here, except that the listed file is not actually opened. Instead PEEK is used to pluck it right out of RAM. This is a tad quicker for our purposes than INPUT.

Note line 2140, which accumulates a full word before printing. This allows for a simplified, if not infallible, word wrap. It also slows the display a bit for easier viewing. Although the PAUSE key can also be used to stop it. The list can be terminated at any time by pushing ESC.

PTBLM. As you might expect, listing a file to the printer is more difficult. For one thing, we need to know how long a page is, how wide the paper is, what margins are required, and so forth. After typing the same set of parameters several dozen times, I decided some default values were in order. These are specified in line 2200:

P is the length of the page in lines;

T is how many blank lines to leave on the top of each page;

B specifies blank lines on the bottom of the page;

L is line length; and

M is how many blanks to leave in front of each line for a margin.

The values chosen are my personal favorites, and you'll no doubt want to put in your own choices there. During the input of this information each default is displayed between square brackets and is used if enter is pushed without any other input.

Lines 2300 to 2360 perform the basis of the print operation, using pretty much the same techniques as the LCD list. A subroutine in 2400 through 2460 controls pagination and margins. When the end of the file is reached control goes to line 2500. Here the paper is fed up to the top of the next page.

Both listing methods end by waiting for enter to be pushed. As with "size", the menu must be rebuilt and redisplayed. The menu cursor is left over the name of the file just listed.

DATED ENTRIES. Needless to say, there are many other features that could be built into the printer-list routine. All it takes is a little programming and a little memory. My goal was simply to make listings a bit easier to read than the memory dump method offered by TEXT.

Ever wish there was a way to automatically include the date and time on entries to NOTE.DO and other files? I have, so I built the Memo function for F3. After making sure the selected file type is Document, this routine draws a line under the last entry in the file and posts the current date and time to it. Then it invokes TEXT for that file. All you need to do is push CTRL and the down arrow to begin entering your note.

Well, that's it for this time. In next month's conclusion I will bring you the "copy" function, which can be used for string-search-and-replace as well as duplication. Also featured is a backup function which will copy all DOCUMENT and BASIC files to cassette, along with a loader to bring them back in case of (R)AMnesia. And can't forget the ever-popular NAME and KILL commands made easier than ever to use. ◀

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A CHOICE OF TWO SPREADSHEETS FOR 100 USERS

Makers of a new spreadsheet program claim it offers features previously unavailable for 100 users. ProSoft Enterprises says VCALC has split screen capability, can link multiple files together by equating cells within different files, and numerous display options via LCD or CRT. It can be used alone or with the video-disk interface.

VCALC sells for $59.95 and comes with written documentation and online help file. It's available on cassette or disk and can be obtained from ProSoft Enterprises, 2026 Alaeloa St., Honolulu, HI 96821, 808-737-5437.

Another spreadsheet, Entrepreneur's, is claimed to offer more power for 100 and NEC users. It's a 16-column-by-50-row financial management tool. The software has full computation capabilities including summation, exponents, and algabraic equations. Other features are expanded command set and creation of printed reports, all for $124.95.

When ordering, specify computer make and model. Orders are shipped within 24 hours by James W. Secor, 2050 N. Collins, 101, Richardson, TX 75080, 214-699-3649.

PMD-100 GIVEN NEW BIRTH AS HOLMES BULLET

Holmes Engineering Inc. has released a new version of its tape drive for the 100.

The required software to operate the Bullet is loaded automatically into your computer. You simply type in a three-line Basic program (which consumes 1K) and run it.

The Bullet solves saving and loading problems encountered with cassette recorders. Weighing about four pounds, it sells for $369.99 F.O.B. Murray, Utah. Add $10 shipping and handling in the United States, 15 percent outside the United States. Wafer tapes are also available.

Contact Holmes Engineering Inc., 5175 Greenpine Drive, Murray, Utah 84123, 801-261-5652 for more information.

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Have you had problems telecommunicating while on the road? Only the most modern hotels have room phones connected into wall outlets with modular plugs that'll accept your modem.

Black Jack solves this problem. The user unscrews the phone mouthpiece and attaches Black Jack on to the handset. The RJ11C direct connect line cord is inserted from the modem. This allows the user with a modem with Touch Tone dialing to dial direct from his computer. When telephone communications are completed, snap off Black Jack and replace the mouthpiece.

This phone-modem hookup gadget sells for $49.95 from The Microperipheral Corporation, 2656 152nd Ave., NE, Redmond, WA 98052, 206-881-7544.

WEATHER WATCHERS CAN USE 100 TO MAKE FORECASTS

Programmed for the 100, Weather Forecaster is a computerized meteorologist. The sailor, aviator, or traveler, enters wind direction and barometer reading into the 100; the software cassette predicts weather information by calculating input against 17 formulas.

The program requires 5K to operate and is priced at $19.95. Contact CAPS Marketing, 2555 Lake Dr., Grand Rapids, MI 49506, 616-676-7555.

GO-ANYWHERE FULL-FUNCTION PRINTER AND BUFFER

The "world's smallest" portable printer has been introduced by TTX Incorporated. The manufacturers say the 80-column, dot-matrix, battery-powered printer is designed for computers like the Model 100. Priced at $229, the three-pound printer fits in an attache case.

TTX also has come out with the Universal Buffer which automatically handles RS-232C serial to Centronics parallel (and vice-versa) interfacing changes. With 64K capcity, this $269 device has dual power options, data transmission rates from 50 to 19,200 baud. It works with most modems, computers, and printers.

Both are available from TTX Incorporated, 3420 East Third Avenue, Foster City, CA 94404, 415-341-1300.

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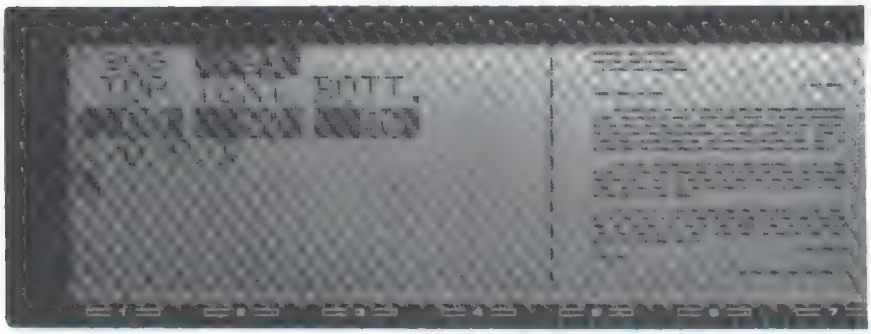

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Size is just one advantage of our 100 percent machine-language code. The other is speed. *Text Power 100*™ formats faster than you can imagine. Faster than all of the competition's products working in parallel. Fast enough to format the Bible in 12 minutes. Right-justified.

Text Power 100™ features: *Page Plot,*™ merge text, edit mode, label printing, page numbering, formatted preview mode, parameter/file memory, right justification, footers, headers, internal format controls, page length, top margin, bottom margin, left margin, right margin, double/single spacing, vertical center, horizontal center, page break display, new page command, full printer customization and more.

Text Power 100.™ For the Model 100, Olivetti M10 and NEC PC-8201A. $49.95 plus $2.00 shipping. Available exclusively from The Covington Group/310 Riverside Drive, Suite 916, New York City, NY 10025/ 212 678-0064, 864-1700.

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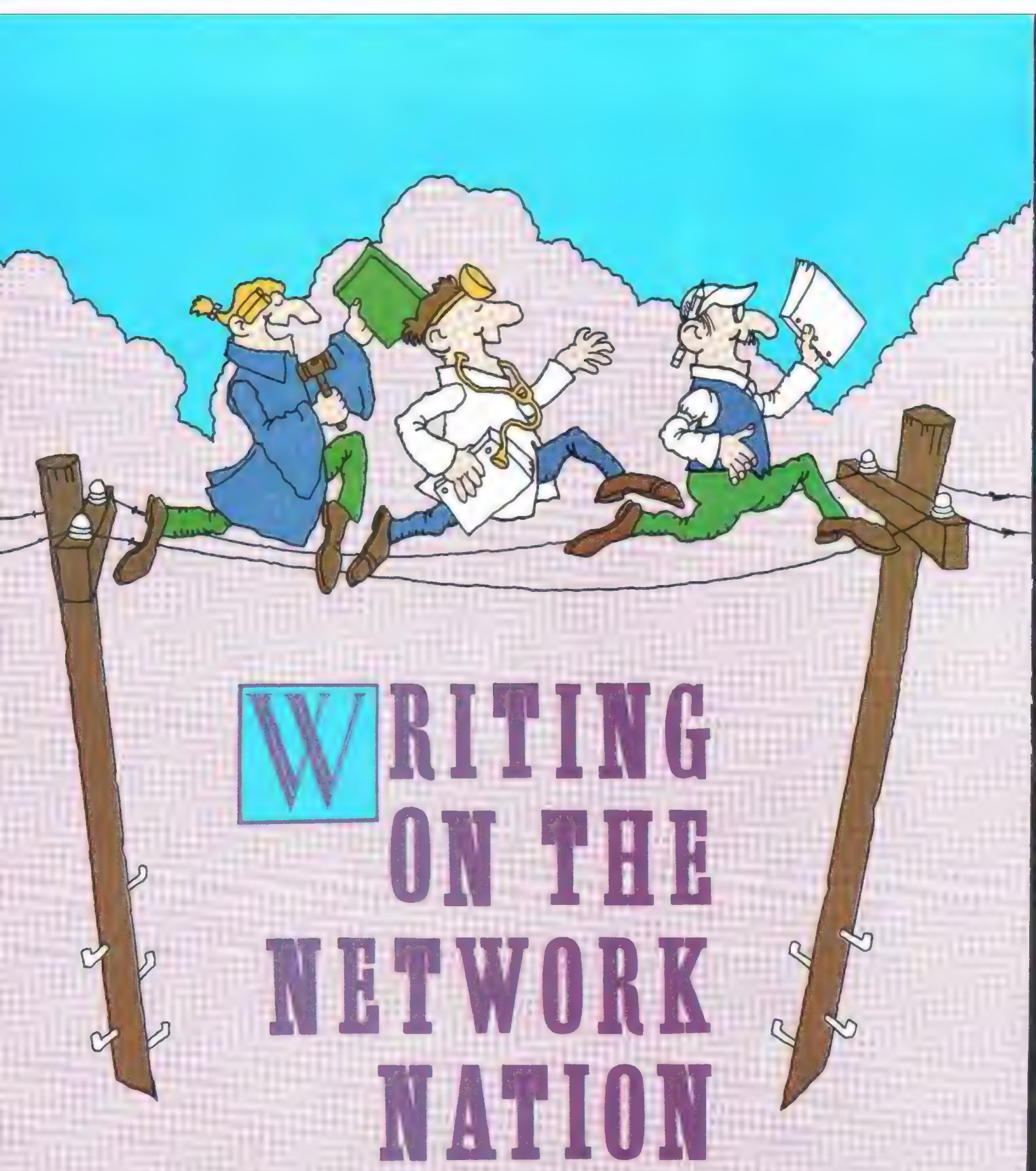

WRITING ON THE NETWORK NATION

Illustration by Rod McCormick

SOURCE OFFERS VANITY PUBLISHERS ALTERNATE RESOURCE

If you're bursting to get published, one route is user publishing on The Source.

By RICHARD BUTT

Billed as *America's Information Utility*, the Source is a major international information data-base service. With over 30,000 subscribers, it offers a variety of interesting features at reasonable rates. One of its most exciting innovations is user publishing.

User publishing was developed in 1980 by a handful of enthusiastic computerists. Dave "Sourcetronaut" Hughes (TCE054), John Rompel (TCE884), Walt Marcinko (TCD 912), and others realized the vast potential of an electronic vanity press where the writer is both editor and publisher.

During the early days of user publishing (Hughes called it Beginvoid and later Source Lab), a swarm of creative talent buzzed around the Source's electronic network developing user files, paperless publications, and programming code. Management at the Source eventually took control by supervising content and offering royalties to the aspiring writer-publishers.

EXOTIC ELECTRONICS. User publishing has grown to encompass a variety of forms from electronic magazines and newsletters to software catalogs. The Source now offers over two dozen different publications (see accompanying side bar) under exotic titles such as: *Mylar's Warp*, *Newsbytes*, *Tradewinds*, and *W-I-N-K* magazine.

When on line with the Source, user publishing is accessed by typing PUBLIC at the command prompt. Various menus divide publications into the following categories:

- The World of Computing;
- Self-Help Department;
- Using The Source;
- Games and Creations;
- Magazines and Journals;
- Novels;
- Things for Sale; and
- Services.

Let's take a look at some of these areas and explore a few of the publications found there.

continued on page 47

A WRITER'S COLONY LIKE NO OTHER IS A KEYSTROKE AWAY

Writers, editors, and lovers of words have formed an electronic writing workshop spanning the nation.

By SHARON LERCH

First, there was the nuclear freeze (*Portable 100*, March 1984, page 14); then there was megatrends; now there is the writing networkshop.

The writing networkshop is an offshoot of a series of electronic lectures (electures) on The Source's Participate. Developed by Irving A. Lerch, participants have included Congressman Ed Markey of the Nuclear Freeze Resolution, author John Naisbitt of *Megatrends*, and Harvard sociologist Daniel Bell.

At this writing, about 125 writers across the country are attending the ongoing electronic workshop on The Source, an information utility that's a subsidiary of *Reader's Digest* and *Control Data*.

The forum is the first of many planned networkshops in communications, education, and entertainment designed to bring experts and interested participants together in a large variety of common-interest communities.

ATTEND AT HOME. Instead of an evening course at a local university or YMCA, each writer is plugged into his own computer keyboard. Basically, the concept doesn't differ much from a face-to-face workshop, except in added flexibility. The hours are any time: night or day, seven days a week, and writers don't have to leave home to attend. Also, many more people can be involved.

So far, writers of every persuasion are submitting fiction, nonfiction, and poetry for comments by the other participants. The writer can question or discuss the comments, and even put up a ballot to get an overall view to provoke more discussion.

Because of the workshop's innate flexibility, extras are possible also. There's first-hand, up-to-date information on literary and other writing markets, announcements of contests, and particulars about writers' conferences around the country.

Let's say a person is interested in finding out about literary agents. He joins the appropriate niche to receive all of the relevant notes. And if he likes, he can question, respond, and

continued on page 51

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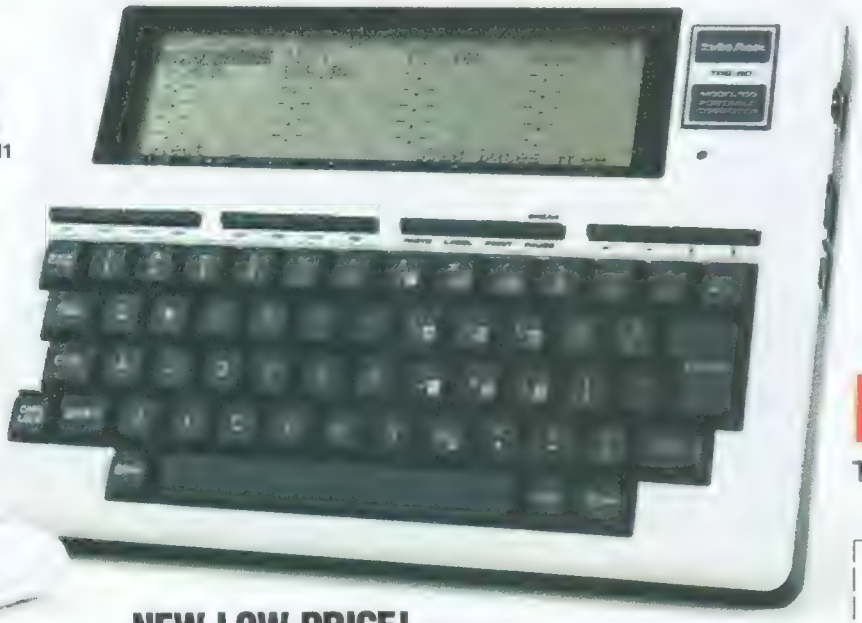

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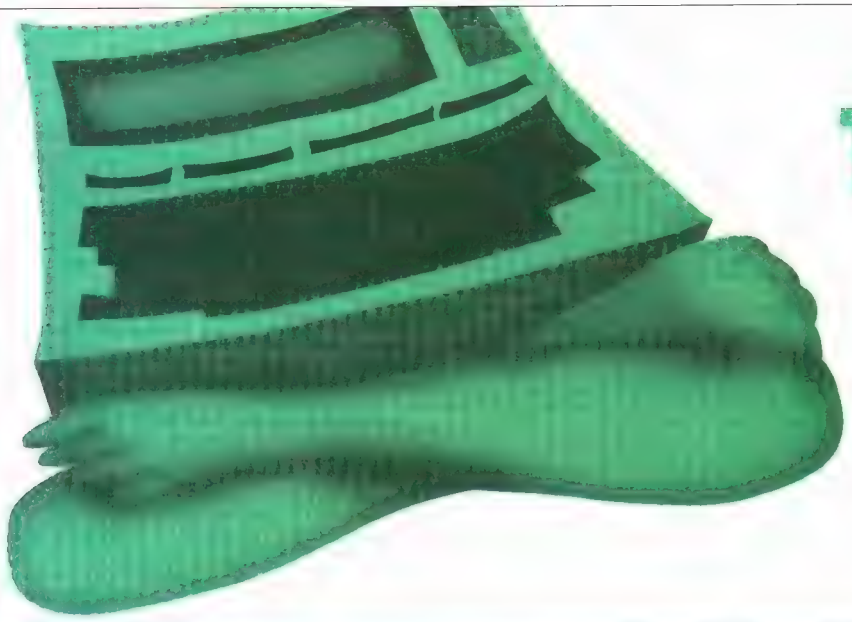

THE MODEL

By RICHARD S. ROSS, JR.

I travel quite a bit and was looking for an IBM-compatible way to keep in touch with my office, as well as a way to dash off memos, letters, or reports from remote locations. Enter the Model 100, looking for all the world like the perfect mate for my IBM. At last, I thought, technology had made it possible for me to carry a portable text-entry device wherever I went.

For several years, I've used IBM personal computers for word processing in my office and at home. With the 100's built-in modem and RS232 port, moving files to the IBM would be simple. Right? Wrong!

While both machines speak the same language (ASCII), getting them to talk to each other was the source of more than one evening's worth of frustration. But in the end, the hours of trial and error paid off. By following the steps

outlined in this article, you can get your IBM and 100 on speaking terms, too.

REQUIRED EQUIPMENT. I had all I needed to get started: my PC equipped with a RS232 port, a null-modem cable, and of course, my trusty 100.

In order for your 100 to communicate with a PC, you'll need to make sure the PC is equipped with a RS232 port. This port also is referred to as a communications port, modem port, serial port, and asynchronous adapter. Almost all the IBMs now in the field are equipped with RS232 ports.

In the rare event you don't have a RS232 port on your PC, you'll need to buy one. IBM sells its Asynchronous Communications Adapter (part number 1502074) for $120. The same serial port also is available on almost all the multifunction cards sold for the IBM. Some of the most common manufacturers of these multifunction cards are: Techmar, Quadram, AST Research, and Persyst. Many of these after-market multifunction cards represent a better value than IBM-brand equipment.

NULL-MODEM CABLES. A null-modem cable is a cable that allows two computers to speak to each other without benefit of a modem. Both the IBM and the Model 100 have RS232 ports designed to allow the computer to send

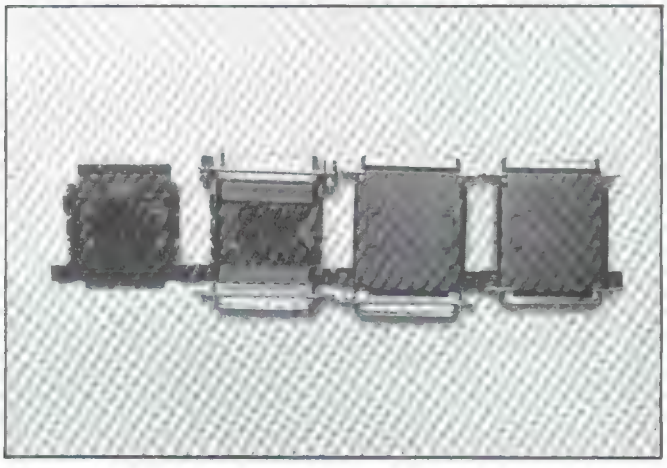

photo 1

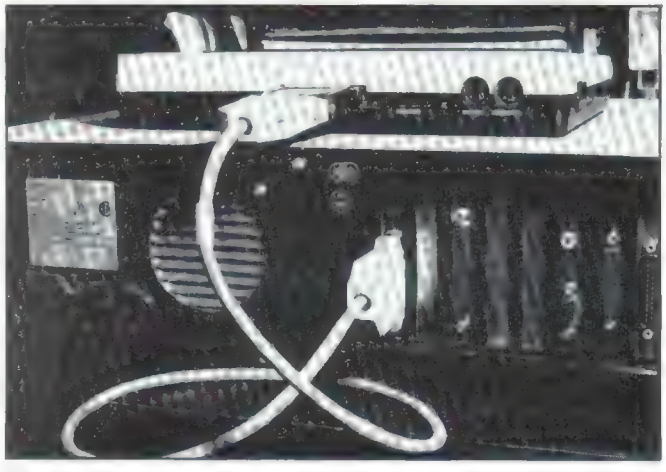

photo 2

100 MEETS THE BIG BLUE MACHINE

Here's a way to get your 100 talking to an IBM *without* buying software.

data on pin 2 and receive data on pin 3. Therefore, if no null-modem adapter is used, the computers will each speak to the place where the other is speaking, instead of to where the other is listening. This is akin to trying to have a telephone conversation while holding the handset upside down with the mouthpiece at your ear and the earpiece at your mouth.

To solve this problem, the null-modem cable or adapter is used. This simple device merely crosses pins two and three so the two computers can hear each other. Any full-service computer store can make you a null-modem cable. Some off-the-shelf null-modem cables don't work since most are male to male, while the IBM requires male to female. If you're more daring, you can make your own. (See *Portable 100*, September 1983, page 38.)

If you already own a modem cable and only want a null adapter, Radio Shack sells one (part number 26-1496) that'll do the job. Be forewarned, the Radio Shack adapter won't fit snugly into the RS232 port of your 100. To make it fit, just snap open the plastic case of the adapter and pull out the male end. Once this is done, you can snap the case closed again and glue the male connector to its new home on the outside (see photo 1).

Armed with the proper cable, the connection is simple. Just plug the female end of the cable into the IBM's RS232 port and the male end into the 100 (see photo 2). Don't be shy. The cable won't fit properly in the wrong place. If your IBM's equipped with more than one RS232 port, be sure you're plugged into COM 1.

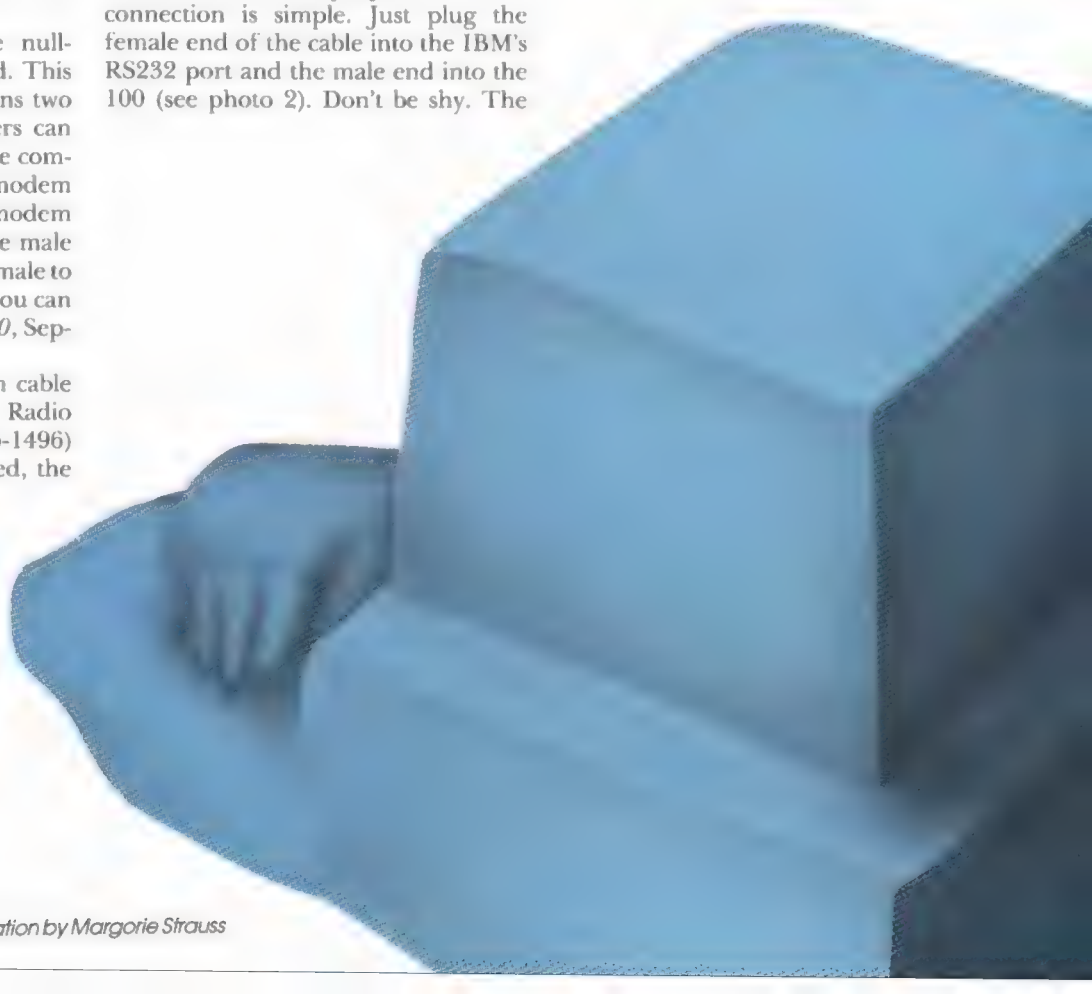

Illustration by Margorie Strauss

FREE. There are many free terminal packages available for the IBM. They can be found on IBM bulletin boards across the country as well as on CompuServe's IBM SIG. In fact, a communications program comes free with every DOS 2.0 package (on the Supplemental Programs disk). I don't recommend using this particular IBM supplied program as it has no ability to save the information being received to disk, and it's written in Basic which limits it to relatively slow baud rates.

The program I settled on is perhaps the most popular of all IBM PC communications packages: PC Talk.

PC Talk is part of an experiment testing the concept of user supported software. The program is marketed by The Headlands Press Inc., P.O. Box 862, Tiburon, CA 94920. The Headlands Press has given permission for users to copy the program and to give it away. All they ask in return is if you like the program, you make a donation of an amount you consider appropriate ($35 is suggested) to help support this effort. This donation is left to the conscience of individual end users. If you'd like a copy of the program, and can't find it locally, write to The Headlands Press, or send me a stamped self-addressed return disk mailer and a blank formatted disk and I'll gladly forward a copy of the program to you. Write to me in care of Secure Systems Inc., P.O. Box 30, Blue Bell, PA 19422, or CompuServe 71256,545, or Source ST6125.

If your system uses single-sided-drives, send two blank formatted disks: one for the program and one for the documentation. Be careful to package them in cardboard so they won't be damaged in the mail, and be sure to mark the envelope: Fragile Handle with Care.

GETTING STARTED. The first order of business is to print the PC Talk documentation. To do this, place the disk containing the PC Talk.DOC file in drive A and type PRINTDOC. The program will prompt you from there.

Once the PC Talk documentation is printed, run the program. If your IBM has 128K of ram or more type TALK128. If your IBM has less that 128K of ram, use the Basic version of PC Talk. First copy BASICA.COM to your PC Talk disk, then type BASICA TALK64. If you're limited to TALK64, you won't be able to transfer information at higher than 1200 baud.

The next task is to tell PC Talk what communications parameters to use. Follow the program prompts until you get the proceed prompt. Now press the key marked ALT while at the same time pressing the F key. You now can set the communications parameters, screen color, and drive on which to save files.

Set the communications parameters as follows: baud rate 2400; parity N; data bits 8; stop bits 1

TIME AND SPACE. I've tested this set of parameters on several IBMs and have found it to be optimum. Even at PC Talk's maximum speed of 9600 baud, the transfer isn't much faster.

There are two reasons for this: the small size of the buffer PC Talk allocates, and the time it takes the IBM to write the information to disk. The rest of the parameters may be left unchanged. However, if you want to store files on a separate disk in drive B, specify "B:" next to the "logged drive" prompt.

You also can elect to store files on drive B by typing "B:" in front of the

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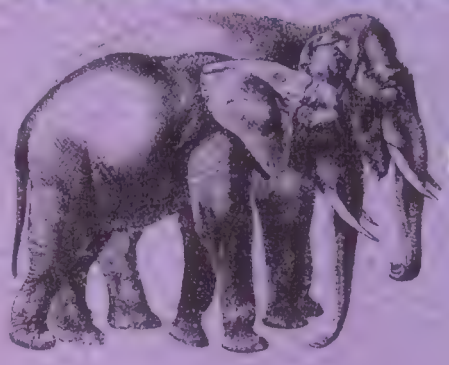

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filename at PC Talk's file specification prompt. When the program asks: Make these changes permanent (y/n)?, answering y will store the new information on your PC Talk disk so it won't be necessary to reenter the new communications parameters every time you run the program.

SENDING INFO. Now that PC Talk is set up and the connection is made, it's time for the transfer. Make sure you have the Proceed prompt on the IBM. Then, open a file on the IBM by pressing the ALT key and at the same time pressing the R key. You'll be prompted to provide the name of the receiving file on the IBM. Type in a name and press return. If you want to store the information on a drive other than the one specified in PC Talk's default section, simply precede the filename with the drive specification. Open the text file on the 100 that you're going to send to the IBM and press F3; when prompted with "Save to:", type COM:68N1E.

This tells the 100 to use 2400 baud, 8 data bits, 1 stop bit, no parity, and to enable XON/XOFF. Now press return and sit back and watch as the two computers do their job. When the transmission to the IBM is finished and the little arrow that normally marks the end of a 100 file appears on the IBM screen, press ALT and R one more time. This tells the IBM that transmission is finished and to save the file to disk.

I chose this method instead of using Upload in TELCOM so the 100 would send linefeeds to the IBM PC. The reason linefeeds aren't sent in TELCOM is that most true host computers (like Dow Jones, CompuServe, and the Source) don't expect them.

DOWNLOADING FROM THE IBM. My next problem was getting the data back into the 100 when I needed it. I first tried the download function in TELCOM. But with TELCOM I found I couldn't transfer reliably at rates any faster than 300 baud since the IBM was constantly waiting for the 100's slow LCD to catch up. I finally found the solution by using the Load from: function in Text. This method bypasses the screen until the entire file has been downloaded.

To get your data back from Big Blue, first name and open a new text file on the 100. Second, press F2 and at the "Load from:" prompt type COM:68N1E.

Now press return, and then it's over to the IBM keyboard to get that file sent. Press the ALT key and while holding it down tap the T key. When the IBM asks the name of the file to transmit, give it the file name you want sent to the 100 and press return. You won't see anything on the 100's screen. When the file transmission is completed and you see the end of file message on the IBM's screen, press the IBM's control key and while holding it down, press the Z key. This will tell the 100 all the data has been sent and you'll see your file on the 100's screen.

SAVING AND LOADING. With only minor changes, the procedures outlined earlier also will work with Basic (.BA) files. To send a Basic program to the IBM, go to Basic and press F2. When prompted for the file name to load, type the name of the Basic program you want to send to the IBM and hit enter. On the IBM, press the ALT key, and while holding it down also press the R key. When the IBM asks for the name of the file to receive, type in the name

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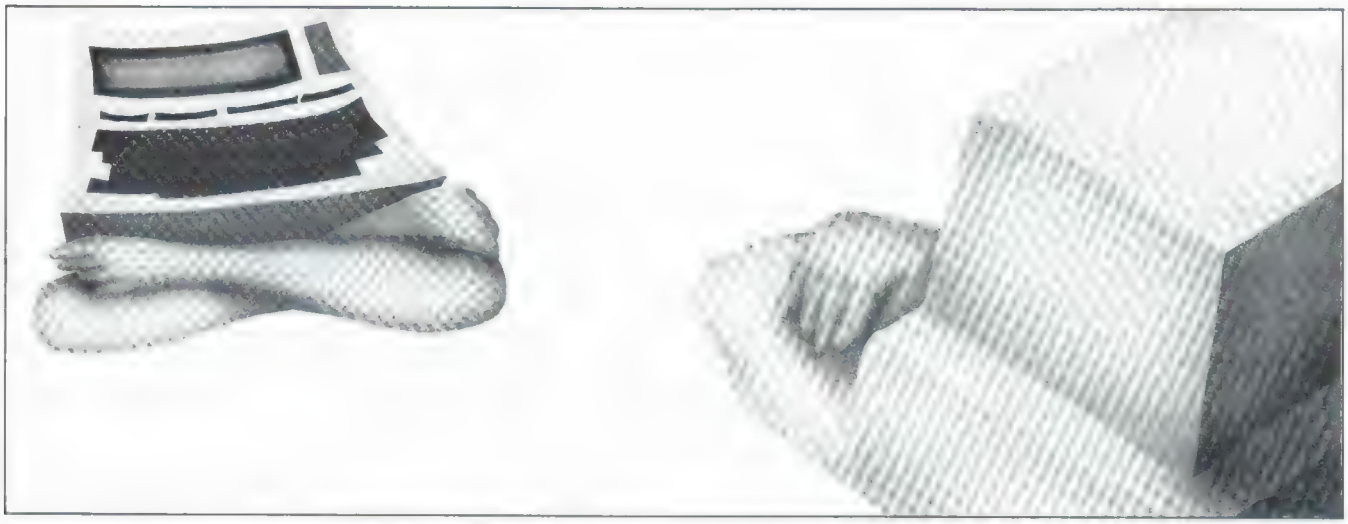

under which you want the file stored on the IBM disk.

Back to the 100, press the F3 key. When prompted with save, respond with COM:68N1E. Watch for the end-of-file marker appear on the IBM's screen, just as you did in TEXT. When you see the arrow, press the ALT and the R keys one last time. Your 100 Basic program is now stored on your IBM disk. One note of caution: It's important to type *new* before loading any file into Basic on the 100. If you already have a program in Basic and you don't type new in between loading Basic files, you'll merge the newly loaded file with the program already in Basic.

TWO ROUTES. To get your Basic (.BA) file back from the IBM, you have a choice. One way is to follow the steps outlined above. Since your file will download as a text file, you next must go to Basic and press F2. When prompted for the name of the file to load, supply the name of the text (.DO) file containing your Basic program. When the conversion is finished, press F3 and type in the name under which you want your Basic program stored. You now can kill the text file.

The second way is to download directly into Basic. This is especially helpful if you're short of space on the 100. When a file is loaded directly into Basic, however, the 100 tokenizes the text as it receives it. For this reason the transfer can't be made at higher than 300 baud. You'll need to follow the procedures outlined in the *Getting Started* section of this article to change the baud rate on the IBM back to 300. *Do not change any of the other communications parameters.* Next go to Basic on the 100 and press F2. When prompted for the name of the file to load, answer with COM:38N1E.

Next press the ALT and the T keys on the IBM. When the name of the file to transmit is requested, answer with the name of the program you want to send to the 100 and press enter. When the IBM signals it's finished sending the file, press the Ctrl and the Z keys. Just as before, this tells the 100 the IBM is finished sending. The final step is to save the file on the 100. To do this press F3, give the 100 the file name, and press enter.

The WRAP. The first thing you learn when you buy an IBM PC is there's a never-ending flow of new products and software. As a result of this parade of new products, there are as many ways to transfer data to an IBM PC as there are leaves on a tree. Like leaves, as old programs fall by the wayside, new and better ones grow to take their place.

I have used successfully this technique for almost a year now, and suggest it as an easy and cost-effective way for you to get the data flowing between your 100 and IBM PC. As you become more familiar with the data transfer requirements of the two computers, you can develop your own methods and design your own system of transfer. ◀

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continued from page 39

REAL *HOT* TIMES. The World of Computing lists electronic creations dealing with either specific computer systems, product reviews, or computing in general. One of its most popular publications is *Real-Times Magazine*, produced by The AppleTree Group from Montreal, Canada. Operating on a tight budget, they produce a lively and at times newsbreaking magazine. In April 1982, *Real-Times* printed a review of the newly released IBM-XT computer, scooping the *Wall Street Journal* by two days. Newstand magazines had their reviews out a month or so later!

Editor Thomas A. Kashuba (TCS091) claims *Real-Times* has the highest recorded usage of any user publishing feature. Kashuba sees his publication as an electronic "magazine for the modern computerist" and offers articles on computer humor, personal lifestyle, and electronic philosophy. Articles embrace the off beat as well as the straightforward article: *Are Gurus Celibate?*, *Lies My Dealer Told Me*, and an ongoing communications tutorial.

Real-Times currently is looking for contributors. There's only one limitation on editorial content: writing should not be crude, obscene, or otherwise insulting to the senses.

LAIDBACK WHO'S WHO. Another category in user publishing that deserves a look is Using The Source. DICHECK, probably the most popular item found here, is a user-contributed on-line directory. Source subscribers can leave pertinent information about themselves for others to see: account number, first name, location, and special interests. It's a good place to look for new friends.

DICHECK came into existence because Neal Eglash (TCC744) wrote the software to check when his friends were on line. They began asking for copies, and from there Eglash came to the attention of Source management and user publishing. Currently, he's working on a more advanced version of DICHECK with new features that'll make searching through the listings even easier.

BILLABLE USAGE/MONTH	ROYALTY PERCENTAGE
$1,000 or more	17.5
$500–$999	15.0
$250–$499	12.5
$249 or less	10.0

Table 1. Payments to User Publishers.

Many Source users search through DICHECK for accounts that'll have a particular interest to them, such as subscribers who frequent the electronic CHAT or those living overseas. You can search through DICHECK by account number, location, or interests. Listing under DICHECK is strictly voluntary so you'll have to enter your own data. It only takes a minute and there are prompts all the way.

SOUTHERN FARE. Magazines and Journals is home of the infamous *Par Mountain Telegraph*: a tongue-firmly-lodged-in-cheek spoof on newspaper publishing. It hollers down from Par Mountain, NC, carrying national and local news, with a good ol' boy punch. Here's a sample from issue number two:

REAGAN ORDERS TROOPS TO CLEVELAND

"Washington (PMT) - Citing growing unrest and fears that such groups as the Guardian Angels and the Committee to Re-Elect Dennis Kucinich are communist-inspired plots, President Ronald Reagan today ordered the Defense Department to send unarmed advisors to assist the Mayor of the City of Cleveland to quell possible voter attempts to overthrow the existing government.

"President Reagan warned of the danger that 'New Cubas will arise from the ruin of today's conflicts' and 'the time has come where we must take a stand to halt communist aggression, and Cleveland is the place I have chosen.' "

Penned in down-home, low-key style, *Par Mountain Telegraph* offers practical advice on what to do about belching at the dinner table and how to remove any anaconda wrapped around a reluctant neck.

NEWS FLASH. Also found under the magazines and journals category is *Newsbytes*, a synopsis of important computer and high technology news updated weekly. The publishers believe "technology is something to get excited about" and the editorial style reflects this concern. An average issue contains between 12 to 20 articles with an overall reading time of only four minutes. That means a lot of information for your money when you consider the costs of on-line time.

Newsbytes is compiled from dozens of news sources, including some first-

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AUTOPEN N&A - WITH MAIL MERGE OPTION - $39.50

Above program plus an expanded version to merge names, addresses, and salutations into letters from a N&A file. May also be used for envelopes and single width mailing labels. Includes a N&A data management system compatable with the Model 100's built-in ADDRSS and TELCOM programs.

BOOK - SINGLE ENTRY BOOKKEEPING - $29.50

Convenient, easy to use bookkeeping system for self employed persons and small businesses using 52 accounts based on IRS Form 1040 Schedule C reporting requirements. Review your current financial status at a glance and print neatly formatted SUMMARY and DETAILED ACCOUNT records.

TRIP - EXPENSE RECORD & TRIP LOG - $29.50

Keeps track of 8 travel expenses accounts and trip notes. Review data on screen or output neatly formatted reports to a printer with annotated expenses, total by account, and grand total with trip report notes. Also calculates mileage reimbursement or gas mileage from odometer readings.

TFILE - TAPE FILE MANAGEMENT SYSTEM - $29.50

A compact (1.4K) utility program to aid in conveniently managing tape file archives. Single stroke menu selection for reviewing, deleting, and saving files to tape. Saves and loads selected files unattended. Writes annotated file directory on tape leader with printer output for records.

CHECK - CHECK REGISTER SYSTEM - $29.50

Provides detailed records of checking account transactions. Maintains current balance and provides for record review as well as formatted printer output.

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hand reporting by beat journalists. *Newsbytes* has covered Osborne's demise, IBM's introduction of the PC Jr., and telecommunication burglars at NASA.

LAY LAWYERS. Need a will, a proxy, or partnership agreement? Well, user publishing's Service offers Oxbridge Legal Forms. These forms are legally viable; all you have to do is download them into your computer, an incredible convenience. Using these forms can save you hundreds of dollars in legal fees. It's no surprise that attorneys are one of the biggest users of this service.

John Newgate (STN250), an attorney living in Manhatten, is the creator of Oxbridge Legal Forms. He reports that hundreds of Source users have accessed his service. Newgate finds "the most popular, by far, is the simple will form" followed by the pre-marital agreement.

He will be expanding his service from a dozen or so to a thousand forms in the near future and is amazed by the popularity of his user-publishing effort. "Who would ever have thought that legal forms would become popular reading?"

WRITERS GUIDE. Interested in becoming an electronic publisher yourself? It's not that hard and the results can be very satisfying. You'll need a Source account and plenty of imagination. Pat Trenner (STCPUB), the Source person in charge of user publishing, is looking for your creations. They must be "professionally written, updated regularly" and "quick to read and digest."

Trenner also mentions that subscribers want their information delivered quickly and efficiently with no "extraneous graphics or philosophizing."

Don't expect to make a lot of money, however. Though the Source pays royalties each time your publication is read (see table 1), costs for on-line storage, file maintenance, and updating can quickly skyrocket. *Real-Times* magazine spent one hundred hours of on-line time and several thousand dollars starting its service. You decide the size of your publication and your investment.

CREATE A NEED. The best way to get into electronic publishing is to first create a sharefile: a space reserved for you in the public file-storage area of the Source (see sidebar on Creating Sharefiles). Files stored here can be read by other subscribers. Once a sharefile has been created, you can advertise its presence using POST, the Source electronic bulletin board. By measuring the amount of response you get, you'll be able to determine if there's enough demand to move your material up to the user-publishing sector.

To meet the Source's user-publishing standards, you'll need subscriber demand and a quality product. At the moment, Pat Trenner is looking for publications devoted to micro news and services. But if you generate the demand, anything goes.

Once the Source accepts you into user publishing, they'll send you a contract to sign. This assures you of quarterly royalties and makes you responsible for file storage costs and on-line time needed to compose, update, and promote your brand-new electronic baby. To quote Sourcetronaut, Dave Hughes: "The future is unlimited. Will you be there?" ◀

USER-PUBLISHER OFFERINGS

You can access User-Publishing by typing PUBLIC at the command prompt. To avoid reading the disclaimer and introduction or to go directly to a specific publication, type PUBLIC, the publication number, and DIRECT. For example: PUBLIC 113 DIRECT for Apple City. The following is a current list of publications by user publishers. New titles are being added all the time.

Apple City 113 (TCD912)
Christology Course 124 (ST1016)
Clearpoint Int'l. News 158 (TT2560)
Crossword Puzzles 142 (ST9912)
Dial-A-Date 122 (TCA550)
Digital Decisons 118 (BBF611)
Eater's Digest 156 (STY542)
Elephant Walk Enterprises 172 (BBT394)
First Byte Software 117 (STX313)
Gourmet Diner's Club 127 (STQ967)
Image Micro Catalog 171 (ST7367)
Independent Record Releases 175 (STX453)
Jobhunter's Handbook 126 (STV709)
The Muses 151, 114 (TCP831)
Mylar's Warp 161 (MDR002)
Newsbytes 155 (STH256)
New Tech Times 125 (BB1599)
Online Educator 157 (ST6588)
Oxbridge Legal Forms 123 (STN250)
Par Mt. Telegraph 153 (TCS780)
Product Reviews 116 (TCV617)
Public Access Systems 112 (TCU583)

Real-Times Magazine 111 (TCS091)
Ridexchange 121 (ST0926)
S.A.U.G. Magazine 115, 133 (TCA265)
S.A.U.G. Libraries 22 (TCA265)
S.I.G.O.P. Library 21 (TCV176)
Sourcetrek 152 (TCE054)
Teleresource 174 (ST3899)
Vault Of Ages 141 (TCY971)
W-I-N-K Magazine 154, 131 (TCV176)

—Richard Butt

CREATING SHAREFILES

If you're interested in creating an electronic publication on the Source's user publishing, you'll first have to open a sharefile. Sharefiles are spaces you reserve in the Source public file-storage area. These files can be read by anyone, whereas files stored in your regular User File Directory (UFD) are not accessible to other Source users. You can make text files or programs available to subscribers in your sharefiles.

Here's how to create your own sharefile. Use the 100 to write the article, catalog, or program you want to publish. When revised and edited to your satisfaction, store it in the 100's RAM.

Assuming you already are a member of the Source, call your local access number and sign on. If you have bypassed the Source main menu, type menu at the command prompt. Then enter option 7, Creating and Computing. From that menu, select option 5, File Transfer to the Source.

The next menu will ask you whether you want to upload using FILETRAN or RCV. FILETRAN supports flow control in the form of X-ON and X-OFF. RCV waits for a ? before transmitting each line of data. Use FILETRAN when using the 100.

You then will be prompted for the number of lines you wish to transfer between acknowledgements and for a new filename under which your text will be stored at the Source. If you designate an existing filename, the Source will prompt you for an OK to overwrite the file. When all the text has been transmitted, enter control-P or break.

Check your uploaded material to make sure the format hasn't been altered during the transfer process.

Files can be displayed by typing TY or CRTLIST and the filename. Editing is accomplished using the Source editor. Type ED and the filename.

Study the files section of The Source's user's manual to familiarize yourself with the text editor and file composition. When using The Source, you can type HELP SHAREFILES to learn how the shared-files system operates. Here's how to format your new file under a menu program:

At the command prompt, type ASF. This will attach you to your sharefiles area. To acquire the software to manage your publication, you must use a variant of the copy command. At the next prompt type GETSHR. Follow the next steps carefully:

```
SOURCE: Get file from what user's
SFILES area?
USER: STCPUB.
SOURCE: Enter filename:
USER: Here you should type
 READ.BASIC.
SOURCE: Enter new name or e/r:
USER: <enter>
```

Copy the following utilities using the same sequence, substituting these titles for READ.BASIC:

HEADER
MENU.FILE
MENU.MAINT
READ.LOG

READ.LOG is optional. This utility will log the ID of every subscriber who reads your files. Though it provides useful feedback on subscriber interest, it can grow rapidly and add to your on-line storage costs.

You must then contact STCPUB (MAIL STCPUB to send a letter) to have the Source modify subscriber-access rights to your SFILES to allow automatic logging of IDs in READ.LOG and an automatic noting on your menu each time a subscriber reads your files. Your program won't run until this change has been made.

After the Source has notified you of their modification, change the ID in the READ.BASIC file from STCPUB to yours, using the text editor:

```
USER: ED READ.BASIC
SOURCE: EDIT
USER: LSTCPUB
SOURCE: 1200$= "SFILES>
STCPUB>"
USER: C/STCPUB/YOUR-ID
SOURCE: 1200$= "SFILES>
 YOUR-ID"
USER: FILE
SOURCE: READ.BASIC
```

You also may change the name of the READ program to a short title appropriate to your publication's content (for advertising purposes) by editing line 130:

```
USER: ED READ.BASIC
SOURCE: EDIT
```

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USERPUB

```
USER: L"READ"
SOURCE: 130 P$="READ"
USER: C/READ/YOUR-PRO-
    GRAM-NAME"
SOURCE: 130 P$="YOUR-
    PROGRAM-NAME"
USER: FILE
SOURCE: READ.BASIC
```

Now that you have changed the ID line (and perhaps the program-name line as well) in the ASCII version of the READ utility, you must compile it:

```
USER: BASICV
SOURCE: BASICV REV19.0
USER: LOAD READ.BASIC
SOURCE: COMPILE READ (or
    your new name for READ)
USER: QUIT
```

Be patient, this may take a few moments to compile.

You should design a title page for your publication by editing the header file: ED HEADER.

This file will scroll out prior to your menu. Press enter to use the input mode and enter your text and any design you wish.

6. Since you already have uploaded your file to your SHARE-FILES area (if not, do so now) attach it to your menu file. BASICV MENU.MAINT

This is the menu maintenance utility. Follow the prompts and add your files. Time each so that the amount of time it takes to read each file will appear on your menu and save these additions. The time function will take a while, depending on the length of each file.

To review your publication, type: WHOM:BASICV READ.

If you chose not to retain READ>LOG delete WHOM: from this command.

Type TY READ.LOG to see how this file logs in date, time, ID and selections read.

You can make revisions and updates to your file with the READ program. In this way, subscribers may opt to read only your revisions and not the entire file. For instructions on using this feature, type TYPSHR:

```
SOURCE: From what user's SFILES
    area?
USER: STCPUB <enter>
SOURCE: Enter file or pathname:
USER: REVISION <enter>
```

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Remember, if you deleted READ.LOG, leave out WHOM; and if you changed the name of READ, use the new name.

That wasn't so hard, was it? Others have trod this path before you and so it can be done. If you have any problems, just relax and study the menu, seek on-line help, (type HELP and the command you don't understand at the command prompt) contact Pat Trenner at STCPUB or drop a note to me, ST0602.

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— Richard Butt

NETWORKSHOP

continued from page 39

argue. If someone isn't interested, he doesn't have to join; or he can join just to see what's going on and not necessarily join in.

It's also possible to scan the first several lines of a story or note, and not read it all, or break off in the middle of reading it, and no one can accuse you of being rude.

LOTS GOING ON. People are discussing their reading, the plays and films they've seen, and editors are giving submissions advice. There's an ongoing argument about whether or not to submit work that's been printed on dot-matrix printers.

Another participant is trying out the improvisational-theatre technique of role playing to get help on the novel he's writing. One member who's published many articles and several books plans to interview the other participants for a book on computers helping writers. While he gathers material, that same information will be useful to other participants. If someone wants something not there, he just asks — or he starts a workshop himself.

CONSTITUENTS. While the workshop is deemed organized, it's meant to be a free exchange and has the capacity of turning into the world's largest round-table.

People from every corner of the country are showing up. Their ages, too, are broader than found in the regular adult-ed classroom.

Things are getting written that had been shelved, or never started. Some of the members have never written anything before, others have been widely published. Some write mainstream fiction, while others create science fiction, westerns, experimental fiction, love poems, memoirs, and feature articles.

But you don't have to be a writer to get something out of the writing networkshop.

Case in point: Suddenly, an auditor suggested a creative way to participate. He offered to make letter-quality printouts for workshop members — at cost. It's the sort of good, generous sharing that's happening on line.

Now that he's finally speaking up, he's getting something concrete, something's he's wanted all along: help improving his second language, English. His contributions are being edited in his own special conference.

Another case: "Cadaver," the literary-medical expert who's been making helpful and humorous "house calls" in the workshop, now is considering writing pieces for one of the popular medical-health magazines that was profiled on networkshop. Seems he's caught the writing bug, too.

The workshop has been on line since February. The staff started with a published writer of fiction and nonfiction and a moderator who knows the inner workings of Participate. It's he who helps joiners smoothly find their way around the conference.

A third-staffer will take charge of the nonfiction branches. Near-future plans include plugging in an established poet and guest electures by writers, editors, and agents.

GETTING THERE. Within two and one-half months of starting, the workshop contains literally dozens of different

subconferences and over a thousand notes. How do you get started in such a maze? The answer turns out to be quite simple, thanks to the fluid structure of Participate and the control the workshop organizers have over the medium.

If you already subscribe to The Source, to join writing networkshop at The Source command level you type PARTI READ "WRITING NETWORKSHOP". If you already use Parti, then type READ "WRITING NETWORKSHOP".

NO WRITER'S CRAMP. The main thing is that participants join only those activities of immediate interest to them. If a new joiner only is interested in submitting a manuscript for review and finding out about suitable places to submit it, he or she only needs to join two or three conferences to keep abreast of events. The workshop organizers inform everyone of important or unusual offerings elsewhere in the workshop. Also for new joiners, there's a way station where the moderator and other staffers greet them at the gates.

There are advantages and disadvantages to meeting electronically. It's not possible to point to a participant and insist on a response. So, as one participant put it, "There is less pressure to produce." Others, though, have found the prompt: sometimes daily feedback is just the incentive needed.

The work seems to be judged more objectively without recourse as to how the person looks, or expresses himself in speech. Another thing: People aren't attending only to meet other people, as sometimes happens in adult-ed classes. Still, no one's come up with a way to meet for a beer afterwards...yet. ◀

Sharon Lerch, organizer of The Writing Networkshop, has published fiction and nonfiction. Her husband, Irving Lerch, developed electures on Participate. Sharon has been a contributing editor and foreign correspondent for *Chicago* magazine. She also has published articles in *The New York Times* and *The New York Post*. Her fiction has appeared in *Confrontation*, *North Dakota Quarterly*, and *Washington Square Writes*.

WHAT YOU'RE GETTING INTO

In a traditional writer's workshop, the swirling discussion — while focused on a particular story — often leads to paths that must be abandoned because of time constraints. In the electronic workshop, these paths become branch conferences.

At this writing, the networkshop had 13 subconferences (see chart).

The Q & A subconference deals with the processes, goals, plans, and details of the workshop. It has no branch conferences.

News Ideas branches into 15 branch conferences, 9 of them fiction pieces submitted by conference members. The branches include discussions on literary criticism (The Key), medical information (House

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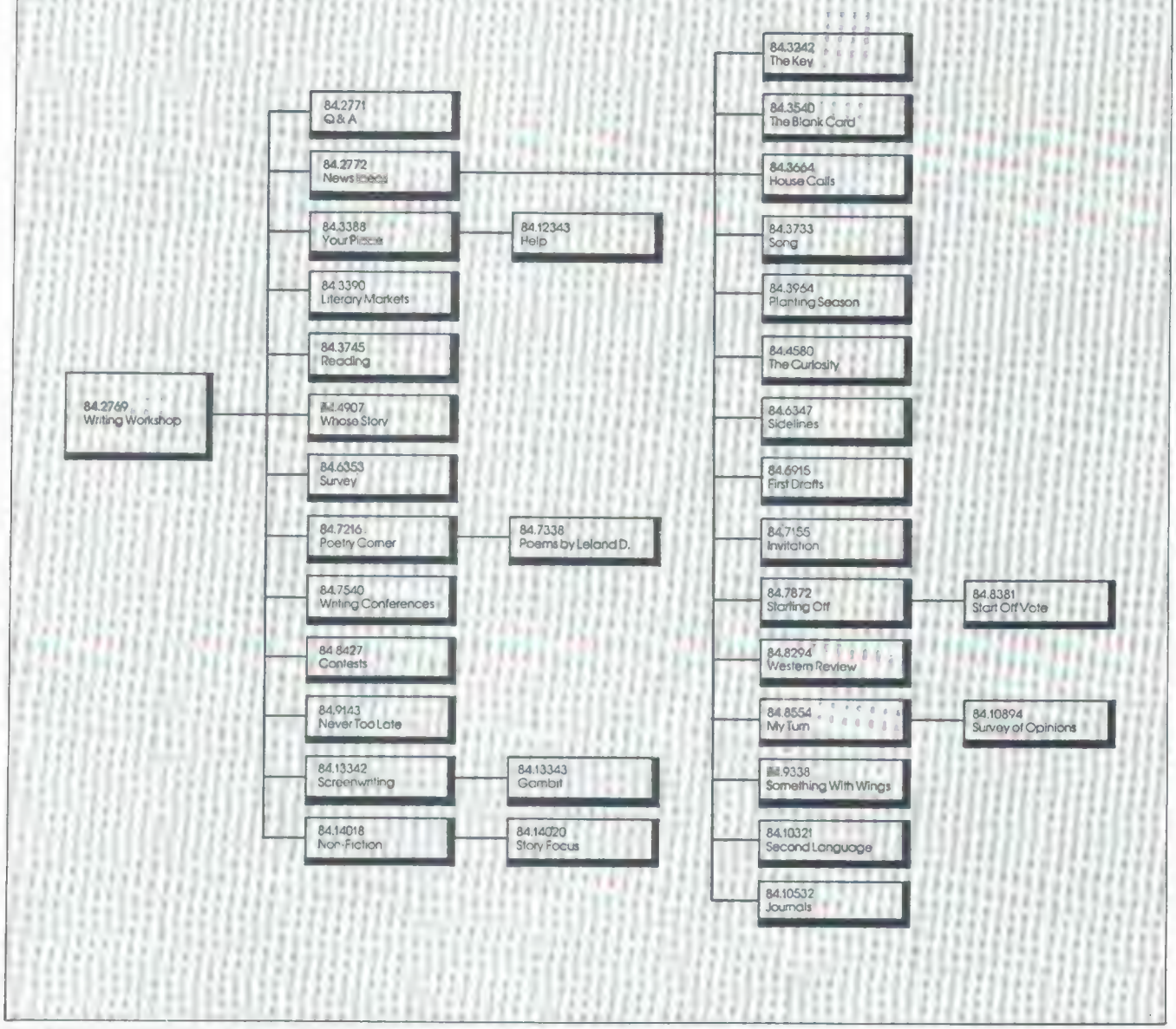
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Calls), and using a journal as a source for fiction. One writer (Starting Off), let readers vote on aspects of his work (Start Off Vote). Another (My Turn) created a subbranch (Survey of Opinions) to discuss his work with his readers.

Your Place provides a sounding board for conference members to make their "wishes, needs, and peculiarities felt."

Literary Markets discusses where to sell material a writer's written.

Reading gives members a place to talk about a book read recently or other literary exposures like public readings.

Whose Story is dedicated to discussing point of view and how it influences how a story is told.

Survey invites members to talk about what direction the conference is going.

Poetry Corner provides poets with a forum for their work.

Writing Conferences keeps members appraised of upcoming traditional forums for scribblers.

Contests tells members about events awarding prizes for writing.

Never Too Late is an empty conference.

Screenwriting is for discussions of writing for film and television.

And Non-Fiction is for sharing information on that form of writing.

In a traditional conference, a writer would get bits and pieces of the kind of information in these branch conferences, but most of those discussions would be nipped in the bud, because they detract from precious time spent critiquing stories.

In the networkshop, though, if an author wants to talk about selling a piece, he or she can go to a branch. And if the author is thinking of turning the piece into a screenplay, advice is waiting in the Screenplay branch. All this can be done outside the straitjacket of absolute time. ◀

—John Mello

WHAT IT COSTS

How do costs compare with conventional workshops?

In urban areas writing workshops typically charge $150 to $200 for 10 to 14 two-hour sessions. (And you have to figure in your transportation costs each time you go.) If you join The Source *strictly* for the writing networkshop, the figure is comparable at first. Amortized, though, the cost goes way down. (Also, all of the other services on The Source are available to you.)

The one-time registration fee to join The Source is $100. (There is no fee to join writing networkshop.) After joining, you're charged only for the amount of time you're actually connected to The Source. (All of your writing may be done off line. If you wish, you may be on line only as long as it takes to upload and download.)

Connect-time charges are $20.75 per hour from 6 a.m. to 6 p.m. and $7.75 per hour after 6 p.m. and on weekends. (Usually active participants are on line for an average of one hour per week or evenings.) There are no additional costs associated with participation in the workshop.

For 300-baud service, daytime use is $20.75 per hour, Monday through Friday, 7 a.m. to 6 p.m.; evening and holiday use is $7.75 per hour, 6 p.m. to 7 a.m. Figures are generally higher in Alaska, Hawaii, and Canada.

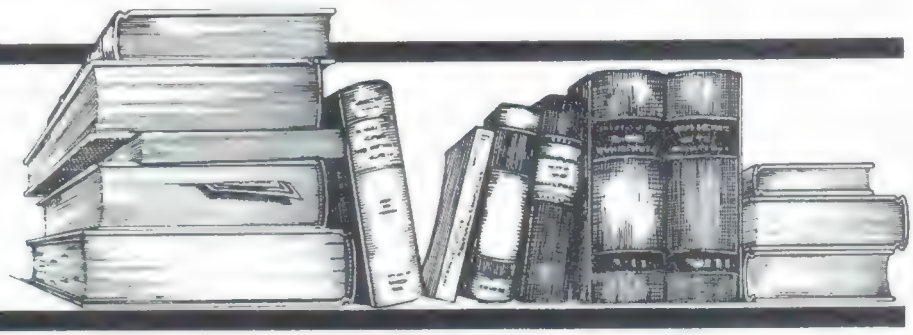
There are extra charges for 1200 baud and storage costs, if you store files on The Source computers.

The minimum monthly charge is $1 for account maintenance (two storage records), $9 for usage, and a 25 cent minimum for connect fees each time you access The Source. Individuals must pay with a major credit card.

It's possible to set up multi-user accounts so the registration fee is split among several subscribers. (And there are times during the year when the one-time registration fee might be lower.)

If you'd like a brochure explaining other services available through The Source, you can call a toll-free number, 1-800-323-1717 (1-800-942-8881 in Illinois) and ask for operator 91. ◀

BOOKS



GENERAL-PURPOSE BOOK PROVIDES DILUTED PROGRAMS

44 Programs for the TRS-80 Model 100
Jim Cole
ARCsoft Publishers
P.O. Box 132
Woodsboro, MD 21798
96 pages
$8.95, softcover

By TERRY KEPNER

Jim Cole's book, *44 Programs for the TRS-80 Model 100*, tries to be a book of general purpose programs to interest a large audience of portable lap-computer owners. Unfortunately, the book fails in this goal mostly because the programs are too simplistic to really be useful.

BANALITY. Some programs seem to have been included just as filler. For example:

- Executive Decision Maker — a five-line program;
- Dual Time Universal Clock — which tells you the local time and the universal time;
- Alarm Clock — which uses the ON time GOSUB command; and
- Backward Writer — which takes what you write and writes it backwards on the LCD.

The programs don't really teach anything or do anything useful. And with space at a premium, no one would want to waste the RAM necessary to keep these simplistic programs in place.

SOME BETTER. To be honest, not all the programs fall into this trap:

- Making Change — calculates the number of quarters, dimes, nickels, and pennies change you get from a purchase. It's a good educational program for a child;
- Advertising Costs — computes the actual cost per sale of your advertising dollar in a business; and
- Inventory — could be a real help to a fledgling businessman.

The five finance programs —

- How Money Grows;
- Deposit Doubler;
- Mortgage Loans;
- Installment Purchase Plan; and
- Rule of 78s Loan-Interest Rebate

— are all good programs. Some of the games and graphics programs also are interesting. But overall, the programs aren't that informative.

MISINFORMATION. Jim Cole also makes two gross errors in his book. First, he says that two programs in memory can't have lines with the same line numbers (that is, you can't have two programs where each has a line number 10). Second, he says the programs will run on the NEC portable computers in the PC-8200 series.

Both these statements are wrong. Because of the method used by the 100 to partition off RAM for each program, the actual line numbers used in a program refer only to that program. You can have as many programs with line number 10 (or 20, or 30, or whatever) as you can fit in memory.

Second, the NEC computers don't use the PRINT@ command, so any of these programs which use that command won't work on the NEC. Instead, you have to convert the PRINT@ to the NEC command: LOCATE X,Y, where X is the column position and Y is the line number. Unfortunately, Cole doesn't mention this anywhere in his book.

SLOPPY APPEARANCE. My next two complaints deal with the format of the book. All the programs are hard to read because they're reproduced from dot-matrix listings and are in all uppercase letters.

The line-listings could easily have been done with a daisy-wheel printer which would have improved the appearance of the book considerably. This would have eliminated the variation of dot density that each line in the book now shows (the character 9 is almost always lighter in shade than the character H). And the lack of lowercase simply shows a lack of professionalism in the programming. Since the computer supports both uppercase and lowercase, why make all the prompts uppercase only?

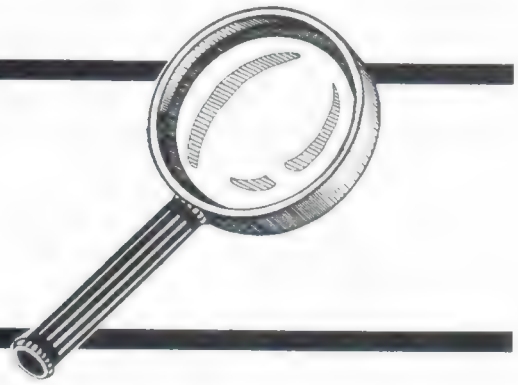
NO LOWERCASE OPTION. This leads to another problem. The prompts that require a letter response, such as Y for Yes or N for No, only accept uppercase as a valid input. Since the programmer wasn't thinking of lowercase, he didn't check to see if maybe the program user's response was lowercase.

As an example, Inventory lets you build and keep an inventory of items in your computer's RAM. But who wants an inventory list entirely in uppercase? Switching to lowercase makes for easier reading, but when you try to give commands to the program you have to switch back to uppercase only. Another problem with inventory is it doesn't print to paper. You can only add to the inventory, read the inventory, and erase the inventory, so even one of the more useful programs isn't that well-written.

And while he does supply printed samples of how the programs appear while running, they aren't complete. For example, the sample run of the Number Guessing program finds the number in three guesses, whereas the actual run always takes six guesses.

FOR IDEAS ONLY. In summary, I was disappointed in this book. While some of the programs are interesting, most of them would have to be modified before they could be truely useful. I can't really recommend this book, except perhaps as an idea book or a starting point for your own programs. ◀

REVIEWS



PRO AID OFFERS SOPHISTICATION FOR 100 USERS

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By CARL OPPEDAHL

Pro Aid is a powerful machine-language utility for sophisticated users of the Model 100. It takes advantage of well-known ROM subroutines and a little-known RAM hook in system RAM to provide automatic-line numbering in Basic, 26 new function keys, and a variety of other useful functions.

Pro Aid is shipped on a non-copy-protected cassette. When loaded into the 100 by means of the CLOADM command, it resides, like any machine-language program, in the area between HIMEM (in this case EEF0H) and MAXRAM (F5F0H). In an 8K machine, this leaves somewhat less than half the RAM for user files.

SHIFTED KEYS. When the caps-lock key is down, the shift key normally has no effect on the 26-letter keys. With Pro Aid installed, and the caps-lock key down, each shifted letter becomes a function key, generating as many as 14 characters.

When initially loaded, Pro Aid matches up the 26 keys with commonly used Basic keywords. With a bit of practice this could yield a time savings when one is typing in long Basic programs. Pro Aid allows easy changing of the key meanings. One could make shift-L into, say, a log-in sequence of account number and password, to be used during TELCOM. Or, frequently used words and phrases could be set up for single-key entry within TEXT.

The function-key meanings are stored in the machine-language area of RAM, and so are lost if another machine-language file is loaded there. As a result, if one reprograms a number of the function keys, one may wish to store the new meanings for later reloading. One way to do this is the SAVEM and LOADM commands.

AUTO-LINE NUMBERING. David Sumner, author of Pro Aid, says current orders for Pro Aid are being provided with an auxiliary program ONOFF, written in Basic, which makes it easy for the user to load and restore function-key definitions.

Another feature of Pro Aid is automatic-line numbering in Basic. The escape key, which usually has no meaning in Basic, will cause a line number to appear on the screen just as if it had been typed in digit by digit. The line numbers generated this way have an initial value (usually 10) and increment (usually 10) each of which may be easily changed by the user.

How many times have you typed list and looked to the screen to see 35 ST? Pro Aid can be set to beep whenever the NUMS key is down.

BASIC ENHANCEMENT. Pro Aid coaxes a lot out of the Basic interpreter. Recall that in immediate mode (when a line of text is typed in with no line number) a statement such as PRINT 2+2 will yield a 4 on the screen. With Pro Aid installed, a keystroke puts the computer in calculate mode, a sort of enhanced version of immediate mode. In calculate mode, if you type 2+2, the answer 4 appears; the keyword PRINT need not be typed.

In calculate mode, the syntax of the PEEK and POKE commands is changed so one may PEEK from successive locations, POKE to successive locations, PEEK 16-bit values from address pairs, and POKE 16-bit values to address pairs. In calculate mode, routines are provided to allow conversion between hexadecimal and decimal.

Holding down the control key and pushing a letter key activates any of several additional Basic capabilities (see table 1).

POTENTIAL PROBLEMS. For those who use no other machine-language files, Pro Aid may be installed and forgotten. The only visible reminder is the smaller number of free bytes. For those who use other machine-language files, however, a number of problems can arise. The most insidious problem is the matter of the modified RAM hook which Pro Aid uses to accomplish its high-powered keyboard scanning.

As described in the sidebar "Understanding RAM Vectors," if the RAM hook isn't returned to its original value prior to use of the CLEAR or LOADM, it's quite easy for all user files to be destroyed inadvertently. The manual describes a POKE command which may be used to clean up the RAM hook, but it's easy to forget to do it. (The program ONOFF, mentioned above, has a menu option making it quite easy to correct the RAM hook.) Another potential problem with the use of Pro Aid and other machine-language files is the fact that the various machine-language files compete for the highest location in the machine-language area (see "The Battle of the .CO Files" sidebar).

One must use the relocater provided with current Pro Aid packages if other machine-language files are to be used.

BENCHMARKS. The 24-page manual does a pretty good job of explaining the functions and uses of Pro Aid. It's printed on a dot-matrix printer and the text goes from the first page to the last without a break for illustrations, charts, or tables. There is no index, although the manual is short enough that it doesn't take long to skim the whole thing if a particular part is wanted.

No customer service phone number or mailing address is provided with Pro Aid in the manual or anywhere else. The voice-telephone number (803-733-0980) in the advertisements is an answering service. The person who answered when I called wasn't able to answer any of my questions, but did offer to take a message. When I did get assistance, it was by leaving a message on the bulletin board (803-783-0575).

Pro Aid does what it claims to do, providing single-key entry of words and commands in BASIC, TEXT and TELCOM, and a variety of other handy functions.It's a pretty good value for heavy users of the 100. ◀

CTRL KEY	ADDED FUNCTION
A	Used to put a carriage return at the end of a function-key definition
D	Deletes a range of line numbers *
F	Same as typing FILES
G	Goes directly to ADDRSS
J	Prints starting location and length of the current BASIC program *
K	Enters "calculate" mode (discussed in the text)
L	Changes init al value and increment of automatically generated line numbers
O	Prints the number of free bytes in memory *
P	Same as typing LIST
Q	Same as typing KEY LIST
R	Goes directly to TELCOM
T	Goes directly to TEXT
V	Toggles reverse video on screen
W	Same as typing CLS
Y	Goes directly to SCHEDL
Z	Same as typing PRINT HIMEM
1	Used to redefine a Pro Aid function key

*An asterisk (*) indicates a Pro Aid function going far beyond what may easily be done with simple Basic commands.

Table 1. Pro Aid Basic Control Keys.

HOW PRO AID PERFORMS ITS KEYBOARD FUNCTIONS

Before launching into a detailed discussion about RAM vectors, let's briefly review memory organization in the Model 100. All memory locations from 0000H (decimal 0) to 7FFFH (decimal 32767) are in ROM and so never can be changed by the user. The remainder of the memory locations, from 8000H (decimal 32768) in a 32K machine, to FFFFH (decimal 65535), are in RAM, and may be changed.

While the user may change the contents of RAM locations through the POKE command, almost all normal activities having effects on RAM are accomplished through the Microsoft ROM routines and are pretty carefully controlled. The Microsoft RAM-handling routines do a very good job of allocating and manipulating RAM. Starting from 8000H (in a 32K machine) and going up are:

- .BA files;
- .DO files;
- .CO files;
- Any unused RAM;
- Basic variable area;
- Machine-language area (containing the particular machine-language file actually in use); and
- System RAM area (see "Delving Into the Darkest Reaches of the Model 100's Memory," by Bill Walters, *Portable 100*, January 1984, page 16).

The Basic variable MAXRAM, with the value F5F0H (decimal 62960), gives the boundary between the machine-language area and the system RAM area. The Basic variable HIMEM gives the lower boundary of the machine-language area. In the 100, it almost never happens that the CPU executes instructions anywhere but in addresses below 8000H, namely in ROM. BASIC, TELCOM, TEXT, ADDRSS, and SCHEDL are all in ROM, as are the fundamental routines that accomplish such things as input from the keyboard and the displaying of characters on the screen.

But the behavior of the ROM routines is changeable. To allow later enhancements, and to facilitate correction of bugs discovered only after mass production of the ROM, Microsoft provided some 40 hooks, places where a ROM routine jumps or calls to RAM. The RAM locations, all of which are above F5F0H (in other words, within the system-RAM area), usually contain a single instruction transferring control directly back to the ROM routine. These RAM hooks or RAM vectors are located in three subdivisions of the system RAM area:

- From F5F6H to F612H (decimal 62966 to 62994), allows for expansions and corrections of already implemented features such as interrupt handling;
- From FADAH to FB14H (decimal 64218 to 64276), contains nothing but return opcodes for subroutine calls regarding presently inactive future expansion areas such as the TELCOM F6 and F7 keys (with hooks at FB0CH and FB0EH, respectively). You can demonstrate the F7 key by POKEing different values into the F7 RAM vector. For example, the subroutine Microsoft uses for the BASIC commmand FILES is located at 1F42H (decimal 8002). Thus, if you type POKE 64270,66:POKE 64271,31, then in TELCOM Term mode, the F7 key will generate on the screen a list of user files.
- From FB16H to FB39H (decimal 64278 to 64313), contains instructions to jump to the illegal function call message ("?FC") which is generated at 08DBH (decimal 2267). These are for commands which aren't yet implemented, but which must be flagged with an error message. For example, if you try to open the device CRT: for output without a disk-video interface connected, you'll get the message "?FC Error". That's because the sixteen-bit value stored at FB1AH (decimal 64282) is 08DBH. With the disk-video adapter installed, the value at FB1AH is changed to point to the CRT routine. Table 2 gives a list of well-known RAM vectors.

Keyboard scanning in the 100 happens only when the CPU performs it. Every four milliseconds, the clock/calendar chip (which runs on the backup nicad battery even when the 100 is turned off) sends a pulse to pin 7 of the 8085 CPU, generating a restart 7.5 interrupt. The 8085, if it's powered up, responds to the interrupt by means of a subroutine call to 3CH. The ROM code there leads to 1B32H (also within ROM), which contains a call to F5FFH (decimal 62975), one of the RAM hook addresses mentioned above.

Usually the memory at F5FFH contains the value 0C9H (decimal 201), which is a return opcode. (That RAM location gets its value at the time of a cold start from an initialization value at 0369H.) The return opcode transfers control back to the ROM routine to continue ser-

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vicing the timing-pulse interrupt. The ROM routine checks for depressed keys, and, depending on whether the same key was found to have been pressed earlier, translates the key closure into the appropriate ASCII value. (The translation process is summarized in "ROM Keyboard Tricks for Living Life Beyond INKEY$," by Jake Commander, *Portable 100*, October 1983, page 55.) Once the ASCII value has been determined, the ROM routine places the value in the keyboard-input buffer starting at F685H.

The timing-pulse interrupt routine does more than just read the keyboard. For example, the power-off timer is decremented so if the keyboard is untouched for a certain period, the 100 will turn itself off.

Almost all programs running in the 100 get their keyboard input from the keyboard buffer. As a result, a program such as Pro Aid that puts things into that buffer may be used to simulate the typing of keyboard input for BASIC, TELCOM, TEXT, or almost any other program.

Pro Aid changes the value at 0F5FFH from a simple return to a jump instruction. The jump is designed to transfer control to the Pro Aid program, which presumably has been loaded to the machine-language area (in other words, between HIMEM and MAXRAM). Whenever a keyboard scan is about to take place (because of a timing-pulse interrupt) the RAM vector gives Pro Aid a chance to look at the keyboard before the regular ROM routine does. If any of several usually meaningless key combinations has been pushed, Pro Aid looks up the corresponding text string in a table (also located between HIMEM and MAXRAM), and loads the associated string onto the keyboard buffer, just as if it had been typed in key-by-key.

Suppose Pro Aid is loaded into the machine-language area and executed. Pro Aid modifies the RAM vector for timing-pulse interrupts. You can see this by PEEKing at locations 62975-7. Usually the values found there are 201, 0, and 0, which translate to a machine-language return. With Pro Aid installed, the values are 195, 298, and 240, which translate to a machine-language jump to F0F8H (decimal 61688). F0F8H is part of the Pro Aid program.

If at a later time, some other machine-language file is loaded, using the LOADM into the machine-language area (this might happen by running Portable Computer Support Group's Write+ or a bar-code-reader program), the new machine-language file would write over some or all of the machine-language instructions of Pro Aid. In particular, the machine-language instructions at F0F8H probably wouldn't make sense.

Within a fraction of a second, another timing pulse would be generated by the clock/calendar chip. The interrupt routine would go to the RAM vector, and then would jump to F0F8H. The CPU would start executing whatever it found there. The result would be mayhem. Depending on what the CPU were to find, the result might be damage to or destruction of user files.

The moral of the story is: One must be very careful to restore the RAM hook value before loading something in place of Pro Aid. With Pro Aid, the easy way to do this is POKE 62975,201. Another moral of the story is to make backup files often. The danger of loss of files isn't limited to Pro Aid. Any machine-language program that modifies RAM vectors or other memory locations in system RAM (above F5F0H) can get the user in trouble if the previous RAM contents aren't carefully restored.

One familiar example of such a program is the bar-code reader sold by Radio Shack (26-1183). It modifies the RAM vectors at FB20H, FB22H, FB24H, and FB26H so that, instead of displaying a ?FC error, the 100 jumps to bar-code-reader machine-language routines at F199H, F1ADH, F1B8H, and F1B1H respectively. If the appropriate machine-language file, namely a bar-code-reader driver, is located there, nothing bad will happen. But if some other material has been loaded there, user files may be lost when a WAND open is performed. Radio Shack provides a subroutine to clean up the WAND vectors (CALL 61807), which must be called before exiting any Basic program using the bar-code reader.

The risk of destruction of user files arises whenever a machine-language file in the machine-language area is overwritten without tidying up the RAM hooks. But loading a new machine-language file into the machine-language area isn't the only way to destroy inadvertently the contents of the machine-language area. Another way is to reduce the size of the machine-language area through the CLEAR command. As a result, a part of RAM previously protected by the operating system (because it was contained within the boundaries of the protected machine-language area) suddenly is exposed to the ravages of the Basic variable handling routines. When some untidy RAM hook value sends the 8085 CPU to such a part of RAM, anything may happen, including loss of all files.

In fairness to Write+, I should stress that the program doesn't tamper with any RAM vectors. It's just that running Write+ will cause the machine-language area to be overwritten. ◀

This and the accompanying sidebar were adapted from a soon-to-be-published book, Advanced Programming of the Model 100, by Carl Oppedahl.

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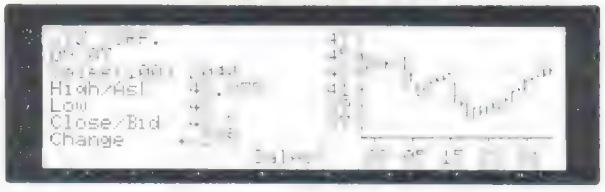

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If one has several Basic programs which are to be used from time to time, they may be left in memory. The Basic interpreter can execute a Basic program regardless of its location relative to other Basic programs in RAM. The Basic program is executed right where it sits in the Basic file area.

In distinct contrast, any machine-language file which is to be put to use must be loaded into a precise part of RAM, the machine-language area, to run properly. This machine-language area, located between HIMEM and MAXRAM, is protected by the operating system.

The 100's operating system also provides for storage of machine-language files in the user-file area, just above the document files. While many machine-language files may exist in the user-file area, only one of them may be in the machine-language area at a time.

Pro Aid, Write+, and programs for the Radio Shack Bar code reader each come with a machine-language file designed to be in the machine-language area, butted up against the bottom of the system-RAM area. The usual practice is for the Basic program requiring a particular machine-language file to load that file from the user-file area into the machine-language area, then gain access to it through CALL commands and RAM vectors.

But what if one wishes to have Pro Aid running all of the time, including times bar-code reader is in use? Pro Aid and the bar-code reader driver cannot, by definition, each be butted up against the bottom of the system-RAM area. Yet Pro Aid is intended to load from 61169 to 62959, taking up 1791 bytes, while the driver for Universal Product Code wand input loads from 61788 to 62611, taking up 824 bytes.

One might suggest the remedy is simply to load both of the machine-language files into the machine-language area, one above the other. But only the highest located machine-language file will run right. Any attempt to use the other would jam up the 100 or maybe destroy user files. Let's see why this is so.

The first reason that a relocated machine-language file causes trouble is that the entry points are relocated as well. Thus Pro Aid, usually starting at 61169 (decimal) might be accessed through the Basic command CALL 61169. But if Pro Aid were moved down 824 bytes to reside below the UPC driver, the command CALL 61169 wouldn't reach Pro Aid's new starting location, namely 61169 minus 824 or 60345.

In contrast, the Basic command RUN "RAM:PROG", will transfer control to the program PROG no matter where it's located in memory. But even if the CALL commands and RAM vectors are corrected to gain entry to a relocated machine-language file, there's a more fundamental problem with relocating a file within the machine-language area. It has to do with jumps.

Just as Basic has its GOTO statements, almost every machine-lan-

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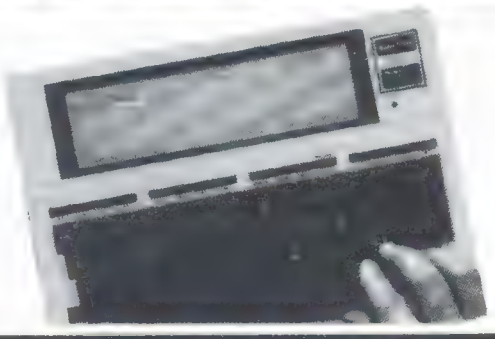

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guage program contains jump instructions. A jump instruction tells the CPU to transfer control to some address other than simply the next address in sequence.

With many CPUs, including the well-known Z80, so-called relative jumps may be used. Such an opcode, containing an eight-bit offset, simply moves ahead or back in memory by a given number of addresses. Through skillful use of such jumps, it's often possible to write a particular machine-language program so that can run perfectly no matter where it's located in memory. If the idea is to jump to an address, say, 10 bytes ahead, the relative jump will accomplish that end regardless of where in memory the program is located.

The instruction set of the 8085 processor (used in the 100) doesn't, however, include relative jumps. The only jumps available are so-called absolute jumps, in which the complete 16-bit address appears in the opcode. Almost any machine-language program of more than a few lines contains some of these jumps; if the program is to be moved to (and executed in) a different part of memory, then each of the 16-bit addresses must be changed. The instruction that would accomplish a jump ahead of, say, 10 bytes from the present location simply doesn't exist in the 8085's vocabulary.

So imagine what would happen if Pro Aid, for example, were moved down 824 bytes in memory and then executed. Sooner or later a jump instruction would be encountered. Suppose it's a jump to 62000. The instruction formerly located at 62000 would now be at 61176, since it moved down 824 bytes. But the jump would still go to 62000. The information stored at 62000 might not even be executable code. The CPU would run amuck, perhaps destroying user files.

By way of comparison, Basic files in the 100 also contain 16-bit addresses, one for each line number, giving the starting location in memory of the succeeding line number. If a Basic file is killed, the user files above it in memory are all moved down to fill in the place where the

HOOK LOCATION	ROM ADDRESS	FUNCTION
F5F9	002D	Bar code reader interrupt
F5FC	6DAC	UART data ready interrupt
F5FF	1B32	Timing pulse interrupt
F602	0024	Low power interrupt
F60F	0380	Option ROM expansion
FB0C	551D	TELCOM Term F6 key
FB0E	551F	TELCOM Term F7 key
FB1A	14F8	CRT open
FB1E	14FA	CRT put
FB20	1881	WAND open
FB22	1883	WAND close
FB24	1885	WAND get
FB26	1887	WAND other
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Table 2. Some RAM Hooks.

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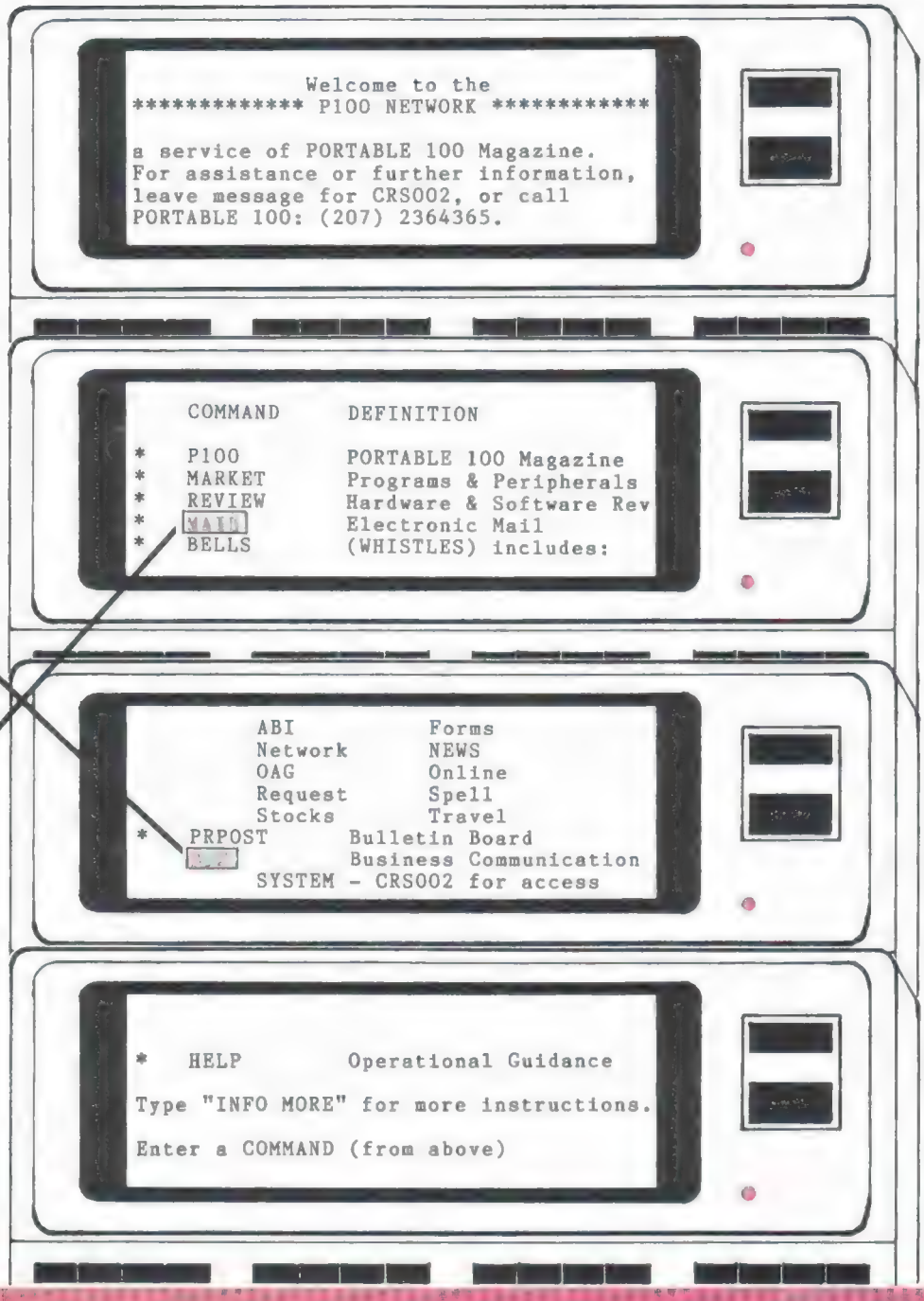

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killed file was located. If any of the user files moved down is a Basic file, then the operating system recalculates and corrects the 16-bit addresses within it.

If a machine-language file has been designed to be executed at a particular location in the machine-language area, then it'll be a waste of time to try to reload it into any other part of the machine-language area. This is reflected in the LOADM and CLOADM commands; each is set up so it'll load only to whatever part of memory the data was saved from originally.

What is to be done, then, if one wishes to use, say, Pro Aid and Write+ at the same time, with two different machine-language files in the machine-language area? Well, if one has an assembler, and access to the source code for either machine-language file, it isn't too difficult to reassemble the file with what is called a different origin, chosen so the file will end up below the other one. The two machine-language files, one of which has been reassembled, may then be loaded into the machine-language area. As long as the new entry points are provided for, one may then leave both in the machine-language area, and use either of the machine-language files as desired.

Publishers usually don't, however, make the source code available to the public. Thus, to relocate a machine-language file one must disassemble it first, figure out which parts of the program are data and which are instructions, and then reassemble it. That's not easy. And some publishers, including Radio Shack, put a statement in the user's manual forbidding disassembly of the software.

According to the publisher of Pro Aid, David Sumner, the program now is distributed with a relocator utility. It's provided so the user may generate a copy of Pro Aid capable of running in the machine-language area below other programs. The internal address references, and RAM hook are corrected for the new location. Corrections also are provided for the affected parts of the user manual. It'd be useful if all publishers of 100 machine-language software were to make such relocation possible. ◀

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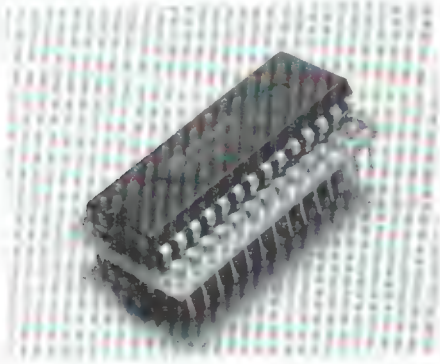

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By JOHN D. PERRY, Ph. D.

If ever there was a computer that didn't need help getting along in the *real world*, it's the 100 and its imitators. I've used mine in classrooms and barrooms, sitting in bus stations and lounging on the deck of an international ferry boat. As one reviewer has already revealed, my wife, too, gets mad because I easily forget to leave it home. But here are two new products that permit not only social, but electrical interaction with the real world.

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circulating blood and forever prevent attacks, for example.

With computerized processing we can offer both analog and digital feedback, a highly effective combination for training. Early attempts to use computers were costly, mostly because of the expensive electrical isolation required to safely interface their line-powered video displays with a real human being. Even when that was solved, the result was often an intimidating array of complex gadgets and wires that induced more stress than they alleviated. The Model 100 promised a new answer to our problems.

DOCTOR IN THE HOUSE. Within hours of receiving the PL-100, I had written and debugged a Basic program which monitors my patient's finger temperature and displays it as a simple moving-line bar graph on the LCD. Similar to the moving EKG display now standard in hospital intensive care units, my program displays the current finger temperature in both analog and digital forms. The past five minutes of temperature read as a bar graph, and the current digital value is displayed in the lower left-hand corner.

Using the 100's string features and TIME$, it's easy to print the elapsed time in a session next to the temperature. With a single glance, I can evaluate the course of our therapy and make appropriate verbal interventions. Meantime, the faithful 100 is also stashing summary data for each minute in an absolutely silent RAM file, for later hard copy.

At the end of each therapy session, my 100 automatically calls up a commercial graphing program (APLOT Vers. 3.0, by Menlo Systems, Palo Alto, CA, $39.95.). Aplot automatically reads my OUTPUT.DO file and makes two copies of a standardized peripheral temperature chart on my RS Color Graphics Printer (CGP-115). One copy is for my patient, to reinforce the progress made in the session; the other goes in my files, to reinforce the insurance carrier who will be asked to pay for the treatment.

TRANSPARENT. If I haven't said much about these products yet, it is because they are easy-to-use accessories. Except for the momentary inconvenience of attaching and detaching the expansion bus connector, they're virtually transparent to the user. Both come with

complete instructions and sample general purpose programs in Basic that take all the effort out of using them. (For faster work, machine-language subroutines can be written, but I haven't found them necessary.)

Both instruments have all strobe and acknowledgement lines hard-wired to the most convenient defaults. For general and immediate application, one needs only to include OUT 2,(Port) to trigger the A/D conversion, and print INP(Port) to read the result. The Humphrey version requires five lines of code, since reading 12 bits on an 8-bit bus requires two steps, but it's still easier to use than sliced bread.

PORTABLE LABORATORY. The Elexor PL-100 is a sophisticated, multi-skilled expansion interface that turns the 100 into a truely portable scientific laboratory. Indeed, more portable than ever before, it includes a built-in rechargeable battery pack of eight D cells that conveniently operate both the 100 and the PL-100 for over 50 hours. Of course regular D cells can also be used; the manufacturer conveniently provides life expectancy charts for popular types. That's just one of the many nice touches that mark a well-designed product.

I really appreciated the quality of imagination in Elexor's promotional literature. They tantalize us with the image of: a remote monitoring system that can control complex processes, record data, auto-dial the mainframe to issue periodic reports, and check its own battery and initiate (and report!) an orderly shut-down in an emergency. NASA couldn't ask for more.

The PL-100 basic input-output board includes all the commonly sought features: 16 channel, 8-bit analog-digital, 4 channel 8-bit analog output, as well as 16 digital bits in and out, and 4 unique "comparator" analog inputs. The latter compare an analog signal to a pre-setable level and issue a digital output if it's exceeded. An extra nice touch is the provision of header sockets and complete instructions for constructing voltage dividers if your monitoring needs are other than 0 to 5 volts.

PHYSICAL ATTRIBUTES. Physically, the PL-100 is a 9.5-by-12-inch steel box that fits under the 100 and raises it 2.5 inches. Alternatively, the unit can be placed under the rear edge of the 100 to make an easel. Personally, I prefer

SISTER DRIVES BROTHER

Maybe you've seen the incredible new Brother EP-44 printer — a battery powered correspondence quality printer just about the same size and weight as your TRS Model 100. Or maybe you already own its predecessor, the EP-22. These are the perfect portable companions to the Model 100, but. .

The usual printing and formatting programs won't drive these Brother printers properly, because of timing and overflow problems, and because of their reliance on printer control characters which the EP printers don't respond to. However.

We at Bullet-Proof Software have developed a tailor made program, SISTER.BA, for formatting text and driving the Brother EP-44 or EP-22 from the TRS-100. It formats .DO document made in TEXT mode and prints a beautiful copy. No more need to "configure" a generalized format/print program that is not geared or really suited to the exact printer you have, or to struggle with confusing parameters — just load and run and print a perfect document first time. NEC PC-8201 versions are also available

We think this program is the most comprehensive text formatter/printer yet made for the lap computer market. It has facilities not found even on many full-blown full-price dedicated word processors. Partial feature list: dynamic margins and line spacing and automatic right justification, conditional and unconditional page end with optional page-number gap, line numbering, underlining, overstriking (for lawyers), centering, right-flushing, paragraph indenting, superscript/subscript, special characters, composite characters (by backspace), soft-hyphen, hard-hyphen, automatic/manual hyphen, required space, word and line counting, alternating-side headers/footers, continuous print from roll paper with optional page throws or stopping for paper tearoff, multiple copies, recover on printer fault, skip through document, automatic dating, default-parameter setting, merge from variables-document (for repetitive letters) or keyboard, print from cassette, stop/interrupt, full vertical margination, headers and footers available together, date and page number in header/footer, starting page number settable, and optional page legend omission on first page (for headed paper).

PS: You won't be happy with this complex program if your machine has less than 24K. *But*, we intend to produce a ROM version soon! Watch this space, but don't hold your breath — full trade-in on the cassette version will be given. By the way, you can change the name of the program once it's loaded if you don't like it!

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Frankly, we wouldn't expect you to believe how cleanly and sharply the type-wheel prints without seeing the results yourself, so we typed everything you're reading right now into a computer and printed it out on the DataPort letter-quality printer.

The character font style is Elite 12. The printing system is by a 5-wheel impact unit. The printer uses standard typewriter paper, 8-1/2 inches in width by any length. The computer interface is Standard Parallel (Centronics Compatible). Printing is bi-directional. The DataPort printer is FCC approved.

- The printing speed is 15 characters-per-second.
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Cost of the printer is $295.00. That's not a printing error, it really is TWO-HUNDRED AND NINETY-FIVE DOLLARS. Shipping, handling and insurance for orders within the limits of the Continental United State is $15.00. California Residents must include 6% sales tax ($19.18). The printer has a full-coverage warranty for 90 days from the date of purchase.

DataPort is the scientific and technical division of Central Stationers, Inc., founded thirty years ago in the San Francisco bay area. The DataPort letter-quality computer printer has been designed to the highest technical and mechanical standards with industrial-quality components for rugged use anywhere in the world. One is waiting for you to tuck into your briefcase and take along with your computer on that next business trip. Sales, technical specification and service are available from:

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the piggy-back mode, with large rubber bands holding the sandwich together. (For a semi-permanent installation, it should be relatively easy to bolt the PL-100 to the bottom of the 100, and then reattach the PL-100 cover to its own base.)

All connections, controls, and the power switch are located on a rear panel. The basic 8-bit I/O board is terminated in four DB-25 female sockets, but the manufacturer also sells eight different breakout boards for easier connections with laboratory or other equipment. These range from a plain $60 screw-termination board to a $150 8-channel optoisolated-triac board, for controlling heaters and motors and other high current devices up to 1600 watts total. Since Elexor generously supplies complete schematics with its device, those who have read a few of the use-your-TRS-80-to-automate-your-birdfeeder articles will have no trouble designing their own relay boards.

Just above the bank of DB-25 sockets are eight more cutouts for the addition of any two of the three expansion boards available. (In addition, an inexpensive option suggests that more than one PL-100 can be daisy-chained to further increase your capacity to monitor and control.) The "high accuracy 12-bit analog expansion board" (at a healthy $400 extra) can handle 32 single-ended or 16 differential analog inputs, and two digital-analog outputs (for $140 extra). That should cover a complex production control or monitoring system.

In additon, a 32-bit digital board ($270) should be available by the time you read this. If you like the basic specs, you can double them by adding a second basic input-output board ($390) above the first. The PL-100 was obviously designed to be versatile and adaptable; it can be configured in a great variety of ways.

MANUALS INCOMPARABLE. What can one say about an analog-to-digital converter? In the world of computer accessories, compared with joysticks and talking boxes and color graphics printers, an analog-to-digital converter is about the dullest gadget imaginable. It just sits there spewing out numbers — one after another, every 125 microseconds if your Basic program is fast enough. Ideally, it adds or subtracts nothing of its own, by definition. By that measure, both devices do what they are supposed to do. Since they both utilize industry-standard integrated circuits for the major functions, that should come as no surprise.

The elegance of the device lies not in its behavior, but in the transparency and simplicity with which it works. An important part of that is the user-friendliness of the manual. Here the PL-100 excels. Although both manuals were reviewed in a photocopy version and both contain the usual typos, they differ dramatically in content.

The PL-100 manual is complete (almost 60 pages), with a systematic and detailed table of contents that makes an index unnecessary. Each section is carefully and very redundantly written, so that a person who wanted to use only the analog-digital converter, for example, could find all necessary information in that one section.

AU CONTRAIRE. The Humphrey manual, in contrast, reminds one of the old Radio Shack philosophy of "protect the user from himself." By furnishing only minimal information in a confused mixture that tries to be both a tutorial and reference manual, it ends up being neither. Their patronizing take-you-by-the-hand approach mixes set-up instructions with product description, often leading to silly sentences. For example, while trying to discover if the Humphry power supply was a recharger (like the Elexor unit) or its only power supply, I encountered: "The jack should be plugged into the backplane (do this now) prior to plugging the power supply into a 115V AC wall socket (do not do this yet). All I wanted to know was: "Is the unit portable?" (It is not.)

The Humphrey manual is a scant 18 pages. Seven pages are a detailed description and listing of a general-purpose Basic program for sampling a specified number of channels per time interval and storing, and later displaying, the data. The program is good and is supplied on cassette to boot.

The Humphrey analog-digital converter has one major advantage over the PL-100, and one major disadvantage. On the positive side, 12-bit accuracy is standard. That permits a 0 to 4.0 volt signal to be conveniently divided into 4096 discrete steps, compared with only 256 steps for the 8-bit types. (The PL-100 with 12-bit accessory costs over $300 more.)

On the negative side, the Humphrey is *not* portable! It's difficult (if not impossible) to understand why anyone would connect a line-powered converter to a portable computer. A large part of the Model 100's cost is for the CMOS (low-power) portability. Presumably one could plug a battery pack into the Humphrey unit, although with some risk and effort, since no schematic is provided. But for the money, I think it would be far cheaper to use an Atari or

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VIC-20 for line-powered applications. The Humphrey device seems, therefore, to suffer from a basic identity crisis.

DESIGN WEAKNESS. The Humphrey is packaged in an unimaginative, conventional plastic utility case (6.5-by-8.0-by-2.5-inches). It's front panel is a red plexiglass lense whose only apparent function is to permit verification of the fact that the device actually contains a printed circuit board. In contrast, the rear panel is a double-sided PC board with convenient screw terminals for A/D input — but also includes conventional integrated-circuit sockets for the 100-bus cable and the digital inputs and outputs. A curious 1.5-by-3.5-inch red plexiglass panel is sandwiched over a part of the exposed PC board tracings, perhaps to protect us from ourselves again.

In overall appearance, the device looks like one of the many Rube-Goldberg contraptions that psychology graduate students throw together in order to finish their dissertation research. If I didn't know better, I might imagine it to be the latest prototype from Steve Ciarcia's Circuit Cellar. The homemade appearance is unfortunate; the product deserves a better case.

On the other hand, if you aren't trying to impress anyone except the budget control officer and can afford the inconvenience of line-power, this might just be a real bargin. In addition to 16 analog-digital channels, it includes eight digital input and eight output lines, and four additional handshaking lines for triggering external devices. After all, you can plug your 100 into the AC line as well. ◀

John Perry is a practicing psychologist and co-author of the best selling book The G Spot.

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By DEBRA M. MARSHALL

A bar-code reader for the Model 100. It was a long time coming, but here it is. I never pass up on opportunity to play with bar codes. After a year as the editor of *Bar Code News*, I jump at the chance to win friends and influence people by showing off my knowledge of the technique behind these stripes.

First, the facts: the bar-code reader resembles a light pen, plugs into your Model 100, and operates in a simple light-scan fashion. The LED senses and measures the widths of the bars and spaces of the bar code you run it across.

The way it translates those signals depends on which bar code you are scanning. You must enter the software applicable to it. Think of the bar codes as different computer languages; you need the correct compiler to run each. In other words, you need to enter the UPC software before you can read UPC bar codes. The scanner plugged into a UPC-loaded computer won't read 3 of 9 bar code.

MORE THAN THREE. There are a lot more than three kinds of bar code. I suggest that if you don't know what type of code you're trying to read, you don't bother trying. You could really get irritated before you discover the right software.

Fortunately, Radio Shack has kindly provided us with software to read the country's three most popular bar codes: 3 of 9 [the code required by the GSA (General Services Administration) on all goods manufactured by outside vendors], UPC (the codes found on grocery items and magazines), and Plessy (the code found on retail, non-grocery store items).

Unfortunately, this style bar-code reader requires contact to read the code. This means that because of the nature of most bar-code labels, your scanner will soon scratch any label or strip of code scanned many times, making it illegible to the scanner. The solution is to resign yourself to covering each code you plan to read with a piece of clear mylar (also thoughtfully supplied by Radio Shack) to protect the code from scratching. (It seems certain that eventually the mylar will become so scratched that it, too, will need replacing.) Neither detail is acceptable in a high-volume situation, especially where speed and accuracy are considerations (and you wouldn't be using bar codes if speed and accuracy weren't a consideration, now, would you?).

OPINIONS. And now, opinion. The documentation that accompanies the reader is fairly clear and accurate. It only rates a "fairly" vote because the listings of the longer bar-code reading demonstration contain several errors. I'm not a programmer, but even I was able to pick up on some of these mistakes — bad news, Radio Shack! So, when the reader wouldn't work the first few times I tried it, I called Radio Shack and talked to a technician, who was convinced I must not be holding the wand correctly. When I pointed out the programming errors, he gulped and called me back with corrections. When the reader still wouldn't read, we were back to the angle of the wand.

Folks, the angle of the wand just ain't that important. You have to be reasonably accurate, but the wand will read correctly, at least on a short test code, if you hold it anywhere within 45 degrees of "correct position" on either axis, and this is a plus. Beginners can get mighty tired very fast of a tricky bar-code wand.

The reason the wand wouldn't read is because something in the computer's high memory was interfering with the program. The documentaion nowhere mentions this possibility — and only in desperation did my friendly technician suggest clearing memory first. Beginning from a cold start solved the problem, and the reader read correctly every time after that.

NO PLESSY. I couldn't test Plessy, having no samples of it, and I could test 3 of 9 only briefly, with a few samples I had leftover from BCN days; but UPC worked perfectly and if that's an indication, we can be happy with the product, even though the documentation leaves enough to be desired.

Included in the tape are programs that will record, catalog, and document data reads from bar codes in several ways, all handy for small inventories. The documentation encourages the user to write his or her own software. I would suggest using the software provided and customizing it. As it is, it provides an excellent skeleton program for most business applications. Depending on the sophistication of the final report you want, it may be fine as is.

The reader works quickly and accurately. If your application won't require many repeat scans of the same label, and your product is all within easy reach of the operator, your Model 100 can become a powerhouse of an inventory tool. If you need to scan the same labels often or the product is in difficult positions to reach, take a deep breath and buy a laser scanner; the Model 100 is too fine a machine to learn to hate because you're trying to do something it isn't meant to do. ◀

Debra Marshall is editor of Color Computer *magazine and former editor of* Bar Code News.

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By TERRY KEPNER

Many Model 100 owners own a second computer system, usually one with disk drives. Because the 100 lacks disk-drive interface circuitry, you can't just plug-in the drives you already own; you must use a disk-drive interface. However, both Model 100 disk-drive interfaces currently on the market include their own disk drives, and cost more than the 100 itself. Why should you have to spend additional money when you already own a working disk system?

Fortunately, the 100's flexible, built-in RS232 communications abilities make it possible to use a secondary computer system as the mass-storage medium. This way you can create text, data, or programs on the 100 and store them on your computer's disk drives. To do this, though, you need an RS232 cable, null modem, and communications program on the other computer. The disadvantage to this is you have to know what you're doing to get the communications portion set-up properly. And once you have it established, you must transfer and store the information one file at a time and issue commands to both computers before actually transferring a file. This makes the

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transfer procedure long and complex. It's also slow since TELCOM only can receive at 1200 baud (cassette transfer is 1500 baud, by comparison).

FAST TRANSFER. Portable Computer Support Group has reduced the work needed for this computer-to-computer communcations and made it not only simple, but actually quite convenient and much faster. Using their Disk+ program, you can move programs and data files between the computers as easily as you now transfer from BASIC to TEXT, at 9600 baud (some computers can go as fast as 19,200 baud).

Disk+'s program operation is patterned after the main menu of the 100: place the cursor over the program or file in which you're interested; press the appropriate function key and your program or file is transferred, killed, or its size in bytes is displayed.

The most difficult aspect of the program is setting it up in your computers, a relatively simple and painless exercise.

THREE PLUS ONE. There're actually four programs in the Disk+ package: one program for your host computer, and three for the 100. The host program is distributed on a disk formatted for your computer. (IBM PC, Radio Shack Model 4/4P, or Apple II are the currently supported computers.) Just follow the instructions in the Disk+ manual for copying the Disk+ program to your DOS disk, making a backup, and loading the Disk+ program in memory. Then load the three 100 Disk+ programs from the included cassette tape, and follow the manual's instructions for saving them in RAM.

With the programs in place, plug the two computers together with a RS232 cable and a null modem, and you're ready to go.

The three Model 100 programs are:

- COMSET .BA - which sets the RS232 in the 100 to the proper parameters;
- Disk+.CO - the machine-language Disk+ communications program, and;
- DISK+.BA - which loads Disk+.CO from storage in RAM to its operating location when you want to use it.

ALWAYS ON DECK. The COMSET.BA is only a few hundred bytes long, and can be deleted after running it the first time (it sets DISK+.CO to the proper RS232 parameters for your host computer). If you have more than one host computer, and they use different communications parameters, you should keep COMSET.BA in memory.

Disk+.CO occupies about 4.4K of RAM, but requires an additional 5K when you run it. This is because the 100 stores .CO files in RAM wherever there's room, then loads them into their proper executing location when you run them. If you're pressed for space in your computer, you can load and execute Disk+.CO via Disk+.BA, then kill both files.

When you want to use Disk+, just go to BASIC and transfer to the program with a CALL 58550 command. As long as you don't use any programs that overwrite the memory area of Disk+, or reset memory protection with the clear command, Disk+ will be always ready.

F KEYS. When you use Disk+, the display looks quite similar to the standard main menu of the 100 (see figure 1), except the bottom line shows the function key assignments used by Disk+. As you can see, six of the eight keys are used:

- F1 will show you the files on your host computer's disk (see figure 2 for a sample display);
- F3 lets you transfer a file from the 100 to your host computer;
- F4 lists the size of any file in RAM;
- F5 removes the file indicated by the cursor (it confirms this with you);
- F6 (Save All) transfers all the files in RAM as a unit, called a subdirectory, to the host computer's disk, and;
- F8 returns you to the normal 100's menu.

Notice that the normal 100 ROM programs aren't listed. This saves wasting space in the directory and on your host computer's data disk.

When you request a host computer disk directory, the function keys are assigned new labels: F1 returns you to the RAM file directory; F2 loads a file from the disk to RAM; F4 lists the size of any file on the disk, except those ending with the .SD extension; F5 removes a file from the disk; F6 (Load All) loads a specified subdirectory into RAM (which erases all current files in RAM); and F8 returns you to the Model 100 menu.

SUBDIRECTORIES. The concept of subdirectories needs amplification: when Disk+ executes the Svall (Save All) command in the RAM directory, you're requested to give a filename, then all the files in RAM are transferred to the host computer automatically, one at a time. A master list of these files is placed on the host computer, with the extension .SD added to the filename you gave Disk+. Now, when you request a list of the files on the data disk, the subdirectory filename is listed instead of all the separate files. This was necessary to make maximum use of the 19 spaces available in the disk directory, otherwise you only could store 19 files on your data disk.

Loading a file or subdirectory from disk to RAM is simple; put the cursor over the filename and press F6. If you should accidently run out of disk-directory room, you can selectively load programs from the disk to RAM, remove them from disk, and save a new subdirectory to disk.

Files in a subdirectory only can be removed by loading the entire subdirectory to RAM, removing the file from RAM, then resaving the subdirectory to disk. Similarly, to see what files are in a subdirectory you must load the subdirectory to RAM. But don't forget to save the files currently in RAM to disk first, or you'll lose them all when the

```
Ram Files     (12330) DISK+ 1.0 (C)PCSG
 STAT.DO    RFU2.DO    LINES.BA   DISK+.BA
 BANK1.BA   DISK+.CO   -.-        -.-
 -.-        -.-        -.-        -.-
 -.-        -.-        -.-        -.-
 -.-        -.-        -.-
Disk .... Save Size Kill SvAll.... Menu
```

Figure 1.

```
Disk Files              DISK+ 1.0 (C)PCSG
 JOB.SD     ADRS.DO     DOODLE.BA  TITLE.DO
 SAMPLE.DO  JULY.SD     UTLTY.SD   MINIVC.BA
 -.-        -.-         -.-        -.-
 -.-        -.-         -.-        -.-
 -.-        -.-         -.-
Ram  Load .... Size Kill LdAll.... Menu
```

Figure 2.

subdirectory loads into RAM.

HOST SPECIALTIES. A major advantage to having a second computer system is that you can do things not possible with the 100, such as spelling checking, or using a powerful word processor to print the text files you created on the 100. The host computer's Disk+ program lets you transfer files from its data disk to a standard DOS disk, so you can take advantage of those special programs on your host computer. And you can transfer files from the DOS disk to the Disk+ data disk just as easily.

To do this, press escape on your host computer (SHIFT CTRL UP-ARROW on the Model 4) to get to the file transfer menu. From this menu select the operation you want: transferring a Disk+ file to a DOS disk; select a DOS file for transferring to Disk+ disk; exit the program; return to Disk+ main system; or set default disk drive (this lets you select a data disk in another disk drive, rather than having to use drive zero all the time).

In order to prevent problems with machine-code differences with machine-language programs and Basic, only document files can be transferred (files ending in .DO). To transfer a Basic program, just save it in ASCII format before using Disk+.

DOCUMENTATION ASIDE. The weakest point of Disk+ is the documentation; it was originally written for the IBM-PC. As a result, almost all the instruction refers to the IBM. Specific pages for the other computers now supported have been added, but it makes reading awkward and a trifle confusing. Another error is that the documentation doesn't tell you to press the LABEL key to replace the function key labels after using one of the function keys (the bottom line is blanked and used for prompts and messages, such as giving the size of a file). The only feature lacking in the documentation is an index to find information on specific functions.

Fortunately, most of the Disk+ commands are self-explanatory and a quick perusal of the *Using Disk+* tutorial in the manual is all that's needed to get you going with Disk.

If you have a second computer and want to use its drives and capabilities to supplement your 100, Disk+ is a great way to do it, at a modest price. ◀

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FULL-DUPLEX

TERRY KEPNER

Editor's Note: Full-Duplex is dedicated to solving reader's Model 100 problems. Readers needing assistance should address their letters to: Terry Kepner, c/o Portable 100, *67 Elm St., Camden, ME 04843. Readers are reminded to include a return address with all Full-Duplex correspondence.*

BLIND ALMOST SEES

I'm totally blind and operate my 100 interfaced with a VersaBraille device. The system works well with one exception: When running a program, I haven't a way of knowing what's on the 100 display, for instance, an error message. A screen dump is possible from the 100 using the print function button. This would solve the problem except the data is sent at the parallel port, instead of the RS232 as required by the VersaBraille. Is there any way to cable, either directly or through a black box, from parallel to serial?

Jack Wood
San Francisco, CA

▶ What you need is a parallel-to-serial converter box. Binary Devices, 11560 Timberlake Lane, Noblesville, IN 46060, 317-842-5020, has such a device that retails for $159.95. Contact them for specific information about their unit.

QSORT OUT OF SORTS

My 100 seems to be different. The variables POS% and IRROR in the QCKSRT.BA are invalid in my machine but FLAG and a few others I've tried are okay. Also, I've been able to locate my RAM.DO files by peeking the directory from 63842 to 64138 and computing the address. However, the address is usually too low and peeking forward from that address from 150 to 180 bytes will find the file. This process is done in one Basic program.

What makes me wonder is the QSORT.CO consistently returns the FILE NOT TEXT when I ask it to sort a .DO file. The operating system is working fine in all other respects.

Bennett D. Shulman
Lansing, MI

▶ POS% is a reserved word in 100 Basic and trying to use it as a variable name will result in a syntax error message from Basic. To use it properly, type PRINT@25,"";:A=POS(0): PRINTA and A will contain the column position of the cursor, 25 in this example.

IRROR isn't a variable; it's part of an operation. IRR is the variable name. OR is the algebraic operator for comparing two integer numbers on a bit-by-bit basis. A complete command would be: IF IRR OR BRR THEN PRINT"ONE".

This would compare the number stored in IRR with the number stored in BRR. If either of them was non-zero, then ONE would be printed.

Your program for computing the starting address of your RAM files is incorrect. To compute the most significant byte of the address to decimal, multiply by 256, not 255. In hexadecimal, you count by twos (1, 2, 4,...), and 2 to the 8th is 256, not 255. That's why you miss by 150 or more bytes.

READER HAS CALC FIX

Recently I purchased the Radio Shack's Calculator for the 100. It has a rather obvious bug, and novice users should beware! Essentially, the programs work fine until you exit them, then you find out all the function keys are disabled when you reenter Basic from the menu. Even F8 is off. You can't return to the menu from Basic except by turning the unit off and back on or by typing menu.

Fortunately, there's a fix for this: load the CALC program from Basic, type EDIT 26010, and change the line from reading simply MENU to 26010 CALL 23164,0,23366:CALL 27795: MENU. Now return to Basic and save the new version to tape. Repeat this for the BCALC program. If your function keys have been disabled, then run one of the programs and exit it to restore the keys.

Stephen Lankton
Gulf Breeze, FL

▶ Thanks for the warning and the fix.

A STEP BEYOND

Your response under *Speed Tricks for Choices From a Menu* (see *Portable 100*, February 1984, page 58) was informative, but could have been taken a step further. To preclude the possibility of the system's not responding to lowercase input, use the following technique: 10 A$=INKEY: IF A$="" THEN 10 ELSE ON (INSTR(" SsIi AaDd...",A$)/2+1)GOTO100,200,300.

Note the leading blank in the test string, which can be any character, must be present. Non-alphabetic characters can also be used as menu choices by simply repeating, for instance INSTR("SsIi//**??").

Jim Gaffney
El Paso, TX

▶ Thanks for the pointer. I never thought of using INSTR in that manner.

DOUBLE SPACING PLEA

For writing manuscripts, it'd be preferable if the text were printed with double-spacing. The instructor at the local Radio Shack store was unable to help me achieve this objective with the 100 and a DMP-200 printer. Is it possible to program the 100 for double-spacing? Perhaps *Portable 100* also would like these instructions in a bar-code format that'd enable those with bar-code readers to bypass the step of typing the instructions each time a double-spaced text is desired.

Rolf Engel
Minneapolis, Mn

▶ There's no way to modify TEXT in ROM to double-space your files when printing. Your only choice is to buy one of the Basic word-processor formatters, sold by several of our advertisers, to give you that ability. Or you could use the text formatter published in *Portable 100* (see September 1983, page 26).

CONVERT OR REFORMAT

Is there a program or POKE to convert the 100 printer baud rate to

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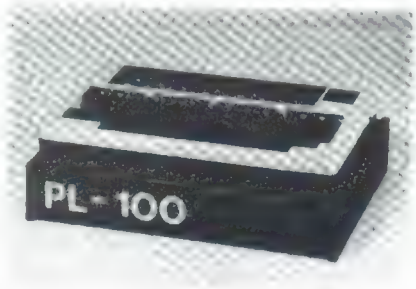

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match the 300-baud rate necessary for an Olivetti Praxis 41 impact printer?

Herman Postma
Oak Ridge, TN

▶ The printer port on the 100 is for a parallel printer, not a serial printer like the Praxis. What you need is a parallel-to-serial port hardware converter. Binary Devices, as mentioned above, carries one.

Another and cheaper solution is to use the SAVE (SAVE"COM:37E1E") and OPEN (OPEN "COM:37E1E" FOR OUTPUT AS 1) commands to send data to the 100 RS232 port. Using an open command like that will let you use PRINT#1 to route all program output to the RS232 instead of the parallel port or LCD display, and the save command will send program listings out the serial port.

Text files are tougher since the save file command won't prompt for a line length. If you want to send text files out the RS232, you may have to get a text-file formatting program from one of our advertisers, or use the one published in *Portablethe 100* (see September 1983, page 26). You also may have to configure the printer to automatically line feed the paper whenever it receives a carriage return.

BROTHER CONNECTION

On Father's Day last year, my son gave me a Model 100. I've been so enthralled with it that often I've been up to 3 a.m. studying manuals. (David Lien's book is the best so far.) My chief use for the 100 has been the ADDRS and SCHEDI. files to take care of my investments, banking, and certificates of deposit. My greatest use will be when I coordinate a printer to my 100.

I travel a lot and the portability of the 100 speaks for itself. I've seen a number of printers on the market, but I'm displeased with them because of their weight. I get dyspneic (short of breath) when I carry more than five pounds.

I'm considering getting the Brothers EP-44 electronic dot-matrix typewriter. Do you think it'd answer my problem of portability plus clarity in typing and printing?

Maurice H. Silk
Boca Raton, FL

▶ It should do the job just fine. It's light, portable, and uses standard paper. According to their advertisement, it has a built-in RS232 port for connecting to computers. To use it with the 100, you would have to have all of your files sent out the RS232 port rather than the parallel port, as the computer now uses.

Using one of the many Basic text programs on the market should take care of that problem. Their advertisement says the EP-44 can be connected to a modem for telephone communications. This means you'll have to buy or build a null modem to place between the computer and the typewriter. (see *Portable 100*, September 1983, page 38). You'll also have to buy a RS232 cable for connecting everything together. Good luck.

CHEAPER TO BUY NEW

I've owned TRS-80 computers since they first came out and have been using the original CTR-41 cassette recorder that came with the Model I. It has never worked well and requires

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numerous attempts to load a tape into the computer. This is holding true even with the 100. I have yet to get a tape to load. It either can't find the program, aborts in the middle of the load, or drops off pieces at the beginning or end of the program. I've tried two different tape recorders and they are even worse. Radio Shack says to buy the new CCR-81, but what makes it different? I don't need the additional expense of a fourth tape recorder.

There used to be a device called a Data Dubber that solved the original Model I's problem. I'm wondering if it would solve the problem with the 100.

Lowell Forsman
Issaquah, WA

▶ I'm amazed that the CTR-41 is still functioning at all; mine died about three years ago, and I'm currently on my third unit. Have you tried cleaning the tape head? (To do this, push the play button without a tape in the machine, then rub a rubbing alcohol-soaked cotton swab back and forth over the tape head, capstan roller, and pinch roller.)

Being that old, the recorder head also could be out of alignment, but that would affect only older tapes recorded when the tape head was properly aligned. Current tapes recently recorded wouldn't be affected unless the head was loose and moved as a recording was made.

Considering the cost of repair labor, it might be cheaper to buy a new recorder. The difference between the two recorders is that the CCR-81 is designed to operate with a computer, it has had its electronics tweaked to deliver optimum performance for the price. You also might consider a new computer-cassette cord. Your old one may have an intermittent short that's causing problems.

FULL-SCREEN AVAILABLE

Is someone working on an 80-column monitor-connection cable for a television set to enable us to hook up our 100s for a full-screen display? That, in addition to the additional memory options you mentioned, would indeed make my year.

Suadi Arabian International School
Riyadh APO
New York

▶ By now you've seen the advertisements for Radio Shack's Disk-Video Interface which gives you 80-column video display capability for about $799. Also available is the MikroKolor Color Graphic Interface from Andreasen's Electronics Research and Development Inc., 1548 Monterey Street, San Luis Obispo, CA 93401, 805-541-6398. This has 256 x 192 display, 15-color graphics capability, 24- or 40-character display with 256 user definable characters, and three graphics modes. Retail price is $335. Write to them for more information.

Keep watching the advertisements in *Portable 100*. Most major products appear there as soon as they're developed. Another good source of information is the Model 100 SIG on CompuServe which does have a few overseas phone nodes. ◀

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allows inexperienced members to visit different SIGs with relative ease. Previously, the novice was confronted with a form of Dungeons and Dragons where each SIG presented new survival challenges.

Many members of the Model 100 SIG were incensed CompuServe would unilaterally dictate changes and implement them without warning, explanation, or directions.

SUPER SIG. The Model 100 SIG has received significant national computer media attention as a magnificent and unique phenomenon. It is a beehive of activity where members provide each other software, technical information, and product reviews.

Simply, every iota of value on the SIG is provided by members, and even the on-line sysop (Dave Thomas) is a volunteer. CompuServe is viewed as a cyclops guarding the cave door and demanding tribute from those who enter.

They were right. However, members felt it was their clubhouse and didn't want their furniture rearranged, at least not by CompuServe.

FEEDBACK. CompuServe's idea of customer service is a busy signal. It doesn't matter whether you use the 800-number or call direct — bring a book (*War and Peace* seems like the right length) and a sedative. Chances are you'll spend the next hour either listening to a busy signal or being on hold. If you do get through, the young people there are capable and helpful.

On-line Feedback is even less responsive. Now they're even running a message which, in effect, says we know we are weeks behind but don't leave your message again.

For over a year CompuServe claims they're "working on it." They should try harder. They aren't two seconds behind on their charging of users; why should they be two weeks behind on customer service?

Speaking of billing, they don't. They charge you all right; they just don't bill you. They deal directly with your credit card or bank account, and if you want an itemized bill to verify their charges, you have to pay computer time for it, or they will send it at $3.50 per bill. How many other businesses charge you for the bill?

You best be sure you have enough on your credit card to pay the bill, because if you don't, the cyclops immediately slams the door shut. Then you get to call their accounts receivable department. Without going into the gory details of personal experience, be forwarned — it's the telephone version of *Night of the Living Dead*.

PAYING FOR CIS ERRORS. A major issue between users and CompuServe is the valueless-time charges.

Depending on the time of day, your screen may inexplicably slow to a crawl or stop, but more typically you'll be looking at a Please Wait or Files Busy message. During these periods, your screen is frozen, but CompuServe keeps the meter running.

CompuServe runs long announcements (their advertising) and keeps the meter running.

CompuServe subjects users to programs that are not debugged and may crash, and keeps their meter running. If you leave (or are knocked off the system) without logging off, CompuServe keeps the meter running for seven to 10 minutes.

CompuServe even has the meter running to inform you that you've been suspended from the system.

In short, CompuServe's best thing is keeping the meter running.

NO EXCUSES WANTED. Whatever explanations CompuServe may have, it seems obvious they ought to have computers, software, documentation, and personnel up to meeting the challenge of the demand their marketing success has created.

Whether the system is working well, or barely at all, the user pays the same price. When working, it's a fair deal. When it is not, it's crummy. I don't mind understanding CompuServe's problems — I just don't want to have to pay for them.

The only free service on CompuServe is Feedback which their public relations spokesperson insists has influence on CompuServe's policy and programs. If you are dissatisfied with any part of your experience on CompuServe use Feedback to let them know.

See how they handle it, how quickly, how courteously, and how completely. If you agree with the major user issues raised here or feel strongly about other problems then let them know. Remember, it's their dime so don't be shy and be sure to be thorough. And then let me know how you feel about CompuServe's response, and I'll keep users informed. ◀

Special Announcement

MODEL 100 128K BUBBLE MEMORY MODULE

Soundsight is proud to announce its new 128K *bubble memory module for the Model 100!* **The module is available in two models, allowing it to be either attached to the** *bottom of the Model 100, increasing it's overall thickness by approximately half an inch (Model 128X),* or set up remotely, *along side the 100 in a small package* approximately 4" x 4" x 2", requiring the use of a cable (Model 128R). Both AC and DC operation is provided, requiring only a small 12 volt adapter. Rechargeable batteries are also compatable. The memory will be expandable to one megabyte (one million bytes of memory) through the purchase of additional modules, requiring factory installation (Model 128X), or reconfiguration (Model 128R).

This bubble memory module has a non-volatile memory which means the memory will not be lost in the event of loss of power or dead batteries. It can operate like a hard disk in which vast amounts of data or programs may be quickly stored, downloaded, and then run in the Model 100's 32k RAM. Upon downloading to RAM, the data is not erased from the bubble memory. With the use of simple sub-routines, programs which exceed the Model 100's RAM may be made to operate by sampling between the 100 and the bubble. No more I/O errors or cassettes or disks that won't read, and no more address or note files which take up the majority of RAM preventing the storage of other programs and requiring tedious cassette or disk procedures.

Power consumption is low because the bubble memory is powered up only when it "reads" or "writes" and it performs these functions in less than a second.

Originally developed by Soundsight for **Stevie Wonder's Model 100,** this module is especially useful to *reporters, programmers* needing remote terminals, or *anyone finding that they need more memory* in order to take full advantage of their investment in the Model 100 and all the software they may have bought but cannot use due to lack of memory.

The two models differ in price and features. The Model 128R sells for $750.00, while the bottom attachment — Model 128X, sells for $950.00. The 128X series allows space for the interfacing of additional 128k memory modules and their power requirements.

As certain programming is necessary for operation of the bubble memory module with the Model 100, the software driver sells for $100.00.

To order, send check or money order payable to Soundsight Communications.

Soundsight

2807 Pelham Pl., Hollywood, CA 90668
(213) 463-1519

Circle No. 76 on Reader Service Card

END USER

PETER STANWYCK

COMPUSERVE IMPERFECT BUT PACKED WITH GOOD IDEAS AND POTENTIAL

CompuServe is like Listerine — I hate it twice a day. In my experience it is unquestionably the most user-unfriendly business operating in the computer marketplace. At the same time it is packed with good ideas, capable people, and unfulfilled potential. It is the home of the Model 100 Special Interest Group, sponsored by *Portable 100* magazine, which, in my opinion, is the single most valuable product or service available in support of the Model 100.

For the few *Portable 100* readers unfamiliar with CompuServe, it is a national computer network which offers a broad range of information which can be accessed through a local phone number.

At 300 baud, CompuServe charges $6 per hour in the evening and on weekends, and $12.50 per hour during prime time.

GREAT POTENTIAL. Many of CompuServe's programs have great potential value, but complex and obscure commands make them unusable. It's not that they're impossible to understand — with obsesssive and persistent effort you can triumph. But why should you have to at $6 per hour?

Email allows users to exchange private mail. Receiving mail is easy. Sending mail, on the other hand, requires you to create a file using some of CompuServe's most arcane and complex commands. It eludes me why the system simply doesn't ask: "To Whom" and then "Type your letter now."

Depending on what you're doing while on CompuServe, there are as many as five totally different sets of commands without rationale or necessity.

CompuServe will sell you documentation, but what I've seen is inadequate for it's purpose. They charged me for SIG documentation which was out-of-date and didn't even bother to have an updated insert.

I use CompuServe a lot, and although their product has plenty of room for improvement, it is the best I've seen available, and in my opinion worth the cost. The problem with CompuServe is not its product but its organization and the way it treats its customers.

MARKETED BY TANDY. Tandy heavily markets CompuServe to Model 100 owners by including the direct-connect modem cable and a CompuServe membership in a single purchase price. Ed Juge of Tandy denies any other direct financial connection between CompuServe and Tandy. Incidentally, talking with Juge is a pleasure. He is one of the least guarded and most forthright corporate spokespersons I've experienced.

CompuServe's greatest value to the end user is its special interest groups.

The content and quality of the various SIGs is uneven, as is the level of participation. The managment of each SIG is by contract with individual system operators, who have a good deal of autonomy as to content. No one would give me specifics about their royalty.

CompuServe recently reorganized these SIGs so each was structured with the same format and commands. These changes were greeted with mixed reviews by regular users. Unifying the SIGs makes sense for the end user as it

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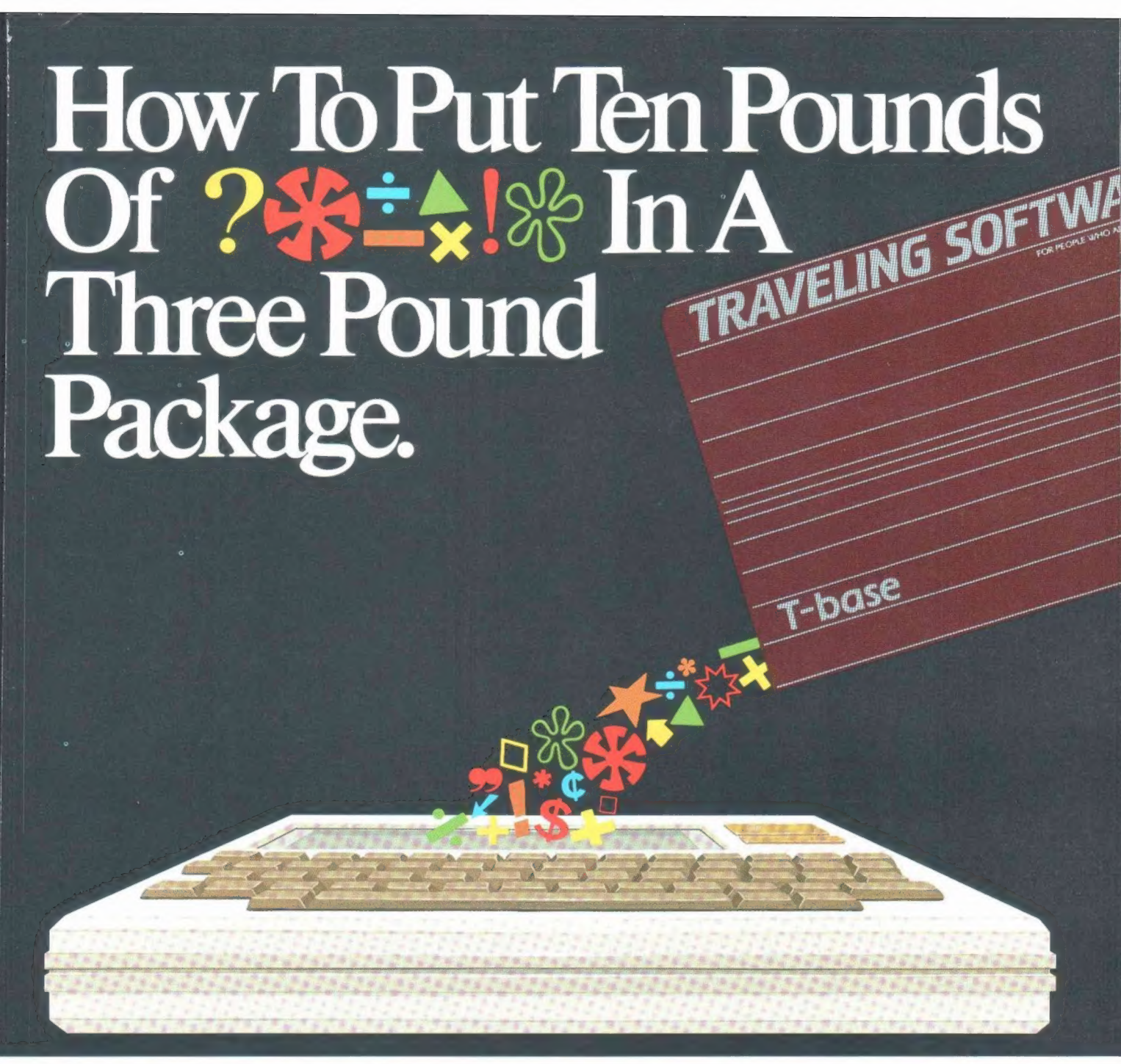
How To Put Ten Pounds Of ?✻÷▲!✻ In A Three Pound Package.



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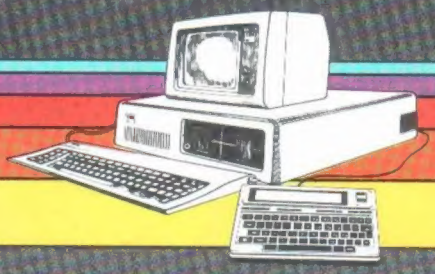

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